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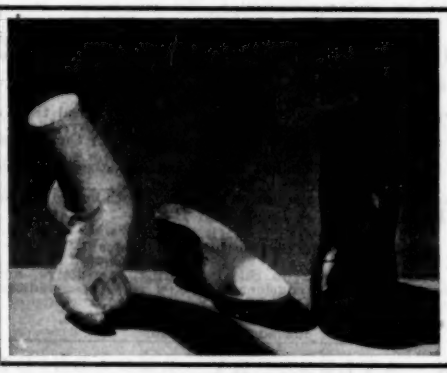

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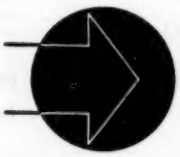

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CONSULTING PHYSICIAN TO ST. BARTHOLOMEW'S HOSPITAL, LONDON; CHAIRMAN OF THE COMMITTEE ON HEALTH CONDITIONS IN AIR-RAID SHELTERS

AT the outset of this address I want to pay a tribute to that vast and anonymous body of men and women who, by remaining in their homes, have reduced the problem of public air-raid shelters to much smaller dimensions than would otherwise have been the case, and have thus contributed greatly to its solution. The Minister of Home Security has given these people his meed of praise; I should like to add my own. These folk have obeyed the Minister's exhortation to "disperse"; they have braved the "blitz" above ground, with the aid of one or other form of domestic protection; or they have been busy during the night with their civil defence jobs, with their nursing, their doctoring and their administrative duties; as I say, no praise can be too high for them.

EVOLUTION OF THE SHELTER

I don't propose today to discuss controversial matters, nor with things as they might have been. Things rarely are what they might have been. As I remember it, there was a demand made from several quarters, that the Government should do something about deep, bomb-proof shelters. After a period of conference between the experts this demand met with a reply which was, in effect, a statement of policy; a policy which we now know as "dispersal." It was first clearly defined in 1938. It was to be implemented through the local authorities, by the provision of steel shelters (later called "Andersons") for domestic use, strutted basements, communal shelters, trenches, subsidiary buildings which might have a peace-time value, compulsory shelters in connexion with new buildings and shelters for persons "caught in the street."

Let us be frank. Most of us were widely off the mark in our estimate both of the particular nature of the peril, its results upon life and property, and the reaction of many of the people. Those enormous number of casualties which many of us visualised did not, thank God, occur. But the damage to our homes far exceeded anything that we foresaw. And so when, in August and September of last year, the air-raids came in all their fury, we were faced simultaneously with two results for which we were quite unprepared: a large number of homeless people who wanted some sort of protection and an even larger number who, losing all faith in their homes, whether they had, or had not, some form of domestic shelter, ran to earth. There is a point past which, in times of crisis, the people will not drill. Policy or no policy, these two masses of people streamed into any underground shelter that seemed to them to be safe. "*Seemed* to be safe," I said, because, again and again, they chose places which were quite insecure and not infrequently under such military objectives as overhead railway stations and the like. They tramped long distances to reach the shelter of their faith; ofttimes this was a haven that was traditional from the last war. They queued up outside, in the rain as it frequently was, and later in the snow, carrying their bedding and various articles needed for the night. This they did day after day, an hour or so before the "blitz" was expected. For, instead of the casual and temporary protection by day which had been met by the provision of surface public and communal domestic shelters in which people might sit or stand, the nightly air-raid attacks called for all-night dormitory protection. For this the surface shelters were not adapted. But nor were the large underground shelters of the people's own choice. Thus there arose, and quickly attained alarming proportions, a situation full of hygienic hazards.

ABUSE OF THE PROTECTIVE PRINCIPLE

The serious risks to the common health were early recognised by the two central authorities concerned. An investigating and advisory committee undertook a rapid survey, reported and made a series of recommendations. There were two outstanding facts: a state of gross overcrowding and its being, as yet, nobody's job to so condition these places as to make them fit for habitation. Some confusion as between the three authorities involved—the ministries, the regional commissioners and the borough officials—was perhaps inevitable. That the onus eventually lay with the local authorities was accepted, but the serious restriction of personnel and material imposed a tiresome lag upon the implementation of the recommendations mentioned.

So that, though at the centre guidance and assurance of financial responsibility were quickly forthcoming, at the periphery execution was tardy. "Priority" was pleaded to an extent which harmonised rather badly with our reiterated assurance to the civilians that they were "in the front rank." The test of our democratic system of local government was a severe one, and we were too nervous of giving the new concept of regionalisation full play, fearing a clash between these two interests. The nervousness was uncalled for, as nervousness generally is, for the appointment of Alderman Key as regional commissioner, with shelters as his special work, has been a marked success. Complications arose from the fact that some of the largest places chosen by the public for night shelter were private property, which had been invaded willy-nilly. In one such place, though the local authority was making slow and entirely inadequate provision, or rather improvision, for sanitation, the cleansing jobs were done—again, and of necessity, inadequately—by the staff of the company owning the property. This gratuitous work, a real bit of national service, was rewarded one morning by the receipt of a notice from the borough sanitary inspector pointing out that a nuisance was being committed by the firm in question!

In a certain provincial centre the owners, or lessees, of a large rambling disused place of entertainment did a good trade by letting out shelter accommodation at so much a week. The only part of the place which could be reasonably regarded as relatively secure was the basement. This had been a "chamber of horrors." Perhaps it was this fact and the paintings of horrific subjects on the wall which dictated the price at this level at 2*s*. 6*d*. On the ground floor the price ranged from 5*s*. to 10*s*. On the first floor, where security was reduced to nil, you might get a small suite for a guinea. A devoted curé acted as cicerone because he knew the intricacies of the place better than anyone else.

In another city, which, though very vulnerable, only suffered night raids, a large shelter under a school was full of people, with a pathetic proportion of children, during the afternoon, and a continuous series of entertainment went on.

In still another town, whose industry has completely disappeared, a disused railway tunnel had been converted into an underground street, and a mean street at that, and the tendency for the population to become residential was increasing. "Blitz" or no "blitz," the children did not see the sun, or even the daylight, for days together, and the old and infirm came to the surface less often still.

I could easily increase these examples of abuses of the principle of protection which led the advisory committee to recommend that all places used as public shelters should be recognised and scheduled, or be disallowed. Recognition was to entail a standard of security as laid down by the Ministry of Home Security and the possibility of being so conditioned as to be free from danger to the public health. The situation had, however, got quickly into such arrears that, even with the provision of alternative shelter, due notice of what was intended and posters stating that what was being done was in the general interest, no little trepidation seized the hearts of some of the authorities on the eve of the closure of the condemned shelter. (Certain political capital, too, was, in some places, made out of the situation.) These fears turned out to be groundless; the people were quite

* Read before the Royal Society of Arts on April 2.

willing to be guided by hands that showed themselves to be firm as well as wise.

PRIMARY DANGERS HEADED OFF

Slowly but surely the primary dangers were headed off. The burden of the work fell upon the borough medical officers of health, who have been key men in the situation throughout, the engineers, and the Regional Commissioners and their staffs. To the energy of the Shelter Policy Committee of the Ministry of Home Security, under the active chairmanship of Miss Ellen Wilkinson, a great deal is owing. Much credit is also due to the Ministry of Health Inspection Committee under Dr. P. G. Stock. A number of voluntary bodies have pulled their weight. The two ministers, Mr. Herbert Morrison and Mr. Malcolm MacDonald, holding this amongst their other and even heavier responsibilities, were constantly at close grips with the problem, and both of them showed an urbanity which remained unbroken by the usual receipt of many more kicks than ha'pence. A great administrator once said that "expediency is the object of all statesmanship," and that "political action is good or bad according to its consistency, not with theory, but with circumstance." The shelter problem has been a good example of this dictum.

Certain guiding principles may be mentioned. Those "optimum standards," which make such a strong appeal, were quite unattainable. We had to start with minimal standards and improve on these gradually as time and the necessary personnel and materials allowed. The limitations of the experts were exposed. Some of them hadn't seen the conditions with which we were struggling, and, again, they wanted time to undertake more research into the questions we asked them. But time, though the pursuit of science does not usually take much cognisance of it, is vital when we are applying science to the life of man. Time was just what we couldn't give. We wanted the help of science at the present moment of its development, not as the result of future experiment, so that we might adapt it to these special conditions. Some of our expert colleagues were very trying. The nearest thing to a public shelter was a canal barge, said one of them, to whom I had appealed on some point; but, he added, reflectively, "a public shelter is *not* a canal barge"; so he couldn't make a suggestion.

Two concurrent policies had to be constantly kept in view—a short-term policy, by which first-aid was applied to the grosser insanitary conditions so as to reduce these as quickly as possible; and a long-term policy, by which the largest and most unhygienic shelters, where the chief dangers lay, might be gradually unloaded as alternative underground protection could be found, or as the people could be weaned from mother earth and induced to disperse themselves in their domestic shelters or in domestic communal shelters which they could be persuaded to make sufficiently attractive. As the autumn and winter approached the problem was further complicated by the fact that many "Andersons" were put out of action by flooding. Almost all the trench shelters were uninhabitable for the same reason, quite apart from their being ill adapted to dormitory use. Thousands of surface brick shelters, from lack of amenities, did not function during the night, and, indeed, were little used by day.

Gradually the more augean of the conditions resulting from the first few weeks of arrears were changed; not in the record time achieved by Hercules, nor by the same method, but still changed. Bunking the shelters got the people off the ground, made sleep more possible for them, and spaced them out. Sanitary arrangements and regular cleansing were introduced; soft earth floors were covered by cement or asphalt; ventilation and lighting were improved. The tube railway system was an early, and a justifiably favoured, place of shelter. The chairman and staff of the London Passenger Transport Board deserve much credit for their labours in conditioning the stations and certain unused portions of the tunnels. Amongst their efforts the system of exhaust plant for the cleanly disposal of the sewage and the admirable series of medical aid posts which, as agents of the Ministry of Health, they installed, should be specially mentioned. A number of large private firms acted with similar promptness and enterprise, providing excellent dormitory accommodation for their own staffs and also for the public. I reiterate that there is no such thing as an "ideal" or "model" large underground public shelter. But some of these shelters under big industrial business premises come as near to justifying these terms as possible.

THE ABSENCE OF ILLNESS

Despite the dangers that seemed to face us, not only have the anticipated epidemics and illnesses not arrived, the health, not only of the shelterers, but of the whole community, has remained remarkably good. A boy fell from the top tier of a bunk and ruptured his spleen, and a woman fell on to the track of the railway and was killed. But those are not shelter diseases; "shelter diseases," as such, have not appeared. What is perhaps even more remarkable, even lice and bugs have been difficult to find; yet at one time the question of airing, cleaning and disinfecting the shelterers' bedclothes gave us a great deal of anxious thought. As for the country as a whole, there has been just as much diphtheria as we deserve, seeing that we will not immunise our children, and the usual seasonal outbreak of measles, though not of a virulent kind. The influenza curve scarcely reached a level which we could dignify by the term "epidemic," and the main seasonal incidence of this pest is, as already stated, now over. Cerebrospinal fever (meningitis) is the one disease that has shown an increase, the cases reaching a higher figure than during any year since 1915. Even so, the figure is not an alarming one.

Public health authorities are puzzled to know the reasons of this robust state of the nation's health. I hear that a small committee is being formed to inquire into this unusual and unexpected state of affairs. Various guesses have been made as to the factors mainly responsible for the relative immunity we are enjoying. Is it due to a better state of nutrition of the people? Or to their greater dispersal? Or, where shelterers are concerned, have they really lived under better conditions, perhaps, than they do in their own homes—more, not less, fresh air, less heated atmospheres, and regular exercise twice a day going to and from the shelters? (When I think of the number of ventilators I have myself opened, braving both looks and language, I can believe that more, and cooler, air may have something to do with it!) We do not know. Perhaps several, or all, of these features have operated. But we must remember that there are unknown elements in the very determination of epidemics. The causes of a rise and fall in the virulence of a bacterium or a virus so far escape us. You cannot *start* an epidemic by bad conditions; but if an epidemic *does* start, then bad conditions affect both the number of cases of the disease that occur and the severity of them.

How much, or how little, of all our work has really been necessary, therefore, we shall never know. Such ultimates are hidden from us. Incentive to action lies in seeing a thing to do and seeing it clearly. We make our contribution in proportion as we do it promptly and thoroughly.

THE SHELTERER HIMSELF

I began by paying a tribute to those people who "stayed put" in their homes or at their posts. For those who have stayed in their beds and without bothering about protection, though my own lazy temperament leads me to have some sympathy with them, my reason denies them my praise. At heart we are an indolent race; we hate to take pains, even though it be to avoid disaster. We take the easy path. Some of us make a virtue of this or our friends often read our inertia as virtue, calling us courageous. But courage is an active, not a passive, trait. Then there are some folk who say they don't mind dying, as though *merely* to die, without getting a decent return for our life, is praiseworthy. It is, as the Roman said, sweet to die for one's country if the sacrifice is demanded, otherwise it is sweeter still to live for one's country, though sometimes this is more difficult.

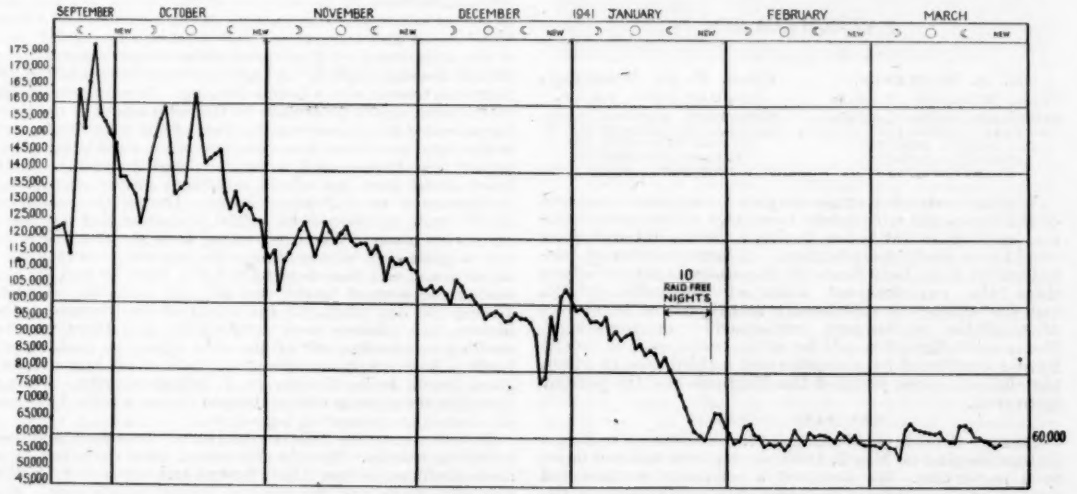
You may gather from these remarks that I do not disdain the modern troglodyte merely because he takes trouble to protect himself. I want to know a great deal more about him before I think him reprehensible, as

many folks consider him. It is one of my chief regrets in this business that we had no time in which to make an extensive census of some of the large public shelters, not merely as to where the people came from, but exactly why they were there. As it is, we know that shelterers are mainly composed of three groups.

(i) There are those who have no homes because they have been bombed out; these should, as we know, go to rest centres and not to public shelters; but people have a way of not doing what they should, and for a number of reasons, some of which are very good reasons. This group is now much smaller that it previously was because the people forming it are being rehoused in increasing numbers.

(ii) The second group includes those shelterers whose homes have no protection within or without, or whose changing. Is it to be wondered at, therefore, that for many of these citizens the conditions that we have now been able to establish represent for them better and, what is equally significant, happier ones than those they had before the night bombing began?

This is a terrible indictment of what is sometimes, and ironically, called "our social system." But it is true. These folk enjoy a communal life, though of a rudimentary sort, which breeds a spirit of good temper and dignity; it enables them to adapt themselves to the nation's exigency with spirit, and the net effect upon their morale is good. It is a superficial, entirely theoretical, and an erroneous view to take of the mass of shelterers that their morale is poor. That it should have needed a war, and life underground for half the



ESTIMATED NUMBER OF PERSONS SHELTERING AT TUBE STATIONS
(including Bethnal Green, Liverpool Street and Aldwych Stations)

"Andersons" have become uninhabitable, or whose communal domestic shelters have no amenities.

(iii) The third group, of poorer people generally speaking, include those who, whether by birth or status or race or type, are unable to stand up to the terror of the "blitz" and the noise that is incident to it.

There is always a hard core of person who cannot stand up against fear and noise. We hear a lot about "foreigners and Jews" who crowd into the shelters. They certainly do. But these folk are British citizens or are under British protection. We must give them as much security as we can, and we must care for them. That is where we differ from the Nazis. In doing this we show them that stability, a sense of security and neighbourly kindliness are qualities which characterise life in our particular Commonwealth. There is no better way in which to demonstrate the British habit of "live and let live" than this, nor need any priggishness enter into the business of this common humanity in face of extreme peril and great discomfort.

"Great discomfort"; yes. Most of these people work by day; sleep is essential to all work; broken nights make work impossible.

HIS OTHER HOME

But what does it mean when the comfortably housed shelter visitor expresses surprise at the queer places and attitudes in which many of these folk get their sleep? And that they are not only patient but good humoured in the midst of beastly surroundings? It means that there is, alas, too little difference between their nights in the large public shelters last September and their nights in their own homes. This great and cataclysmal upheaval has brought into the shelters for our inspection the slum conditions of which we *said* we were heartily ashamed and which, but for the war, we were rapidly twenty-four hours, to achieve a result which is bringing joy to the hearts of our social workers, is a humiliating thought. Yet such is the case. The mood of these people is plastic, and they offer a field for health education as never before. They have, and they appreciate, free medical aid. The mothers submit to the shelter doctor's persuasive argument about diphtheria immunisation when the visit to the clinic for this purpose would never be made. The nurse is listened to with attention and her ministrations are gratefully received. The troglodyte wants to be fit. It intrigues him to know how. To get *among* the ordinary folk and give them sane, simple and homely advice: why, this has been the dream of doctors with any vision for the past hundred years! Here is field work of the best kind in preventive medicine—to keep the fit fit and to make the near-to-fit fit.

DEMOCRACY IN ACTION

A great blot on all this is the position of the children. They should all be away in the country. True, they remain surprisingly healthy, and they behave amazingly well. But these facts do not condone their presence in places which, only by a near miss, have been made hygienically possible. Priestley, in one of his recent broadcasts, stressed the fact that the national emergency is throwing up leaders. We see men and women taking the lead in this communal shelter life: the level-headed, motherly woman, caring for her companions and undertaking for them; the resourceful, humorous man who, as shelter warden, secures obedience with a minimum of grousing. Democracy in action, this, and the best possible refutation of its alleged decadence.

The shelterers want, and they get, their own music and their own culture. This culture is real and is good, different though it often is from the culture we sometimes try to impose upon them from outside. We have not encouraged, and we still resist, attempts to force any

form of "uplift" upon them; it is not fair to place them at the mercy of the pamphleteer and the proselytiser when they can't get away. But to see these patient, kindly, decent human beings hacking out a modus vivendi for themselves under such difficult conditions gives a zest to the efforts of all who have eyes to see and ears to hear.

And the result of all this? I believe that there will emerge from these severe trials to their fortitude and to their health a group of people better fitted to arrange the pattern of their lives in the better days that we are all determined they shall have in the future. If so, then here is one more good arising out of evil, and a good in which it will have been a great privilege, and a great satisfaction, to have assisted.

FAT-EMBOLISM

BY

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WAR wounds often cause simple or compound fractures of the bones and widespread laceration of the subcutaneous and other fat-laden tissues; hence fat-embolism would be a likely complication. A large number of contributions have been made to the study of fat-embolism since the experimental work of Magendie (1821), but the subject is still hardly mentioned in textbooks of medicine or surgery, orthopædics or neurology. Hence we believe it would be of interest to put on record 2 cases confirmed by autopsies and a third case in which the clinical course justified the diagnosis and the patient recovered.

TWO FATAL CASES

CASE 1.—A railway porter, aged 28, was admitted to King's College Hospital on May 2, 1930, having been knocked down by a motor bus. He sustained a compound comminuted fracture of the middle of the right tibia with pulping of the calf muscles. He was sent to hospital by ambulance and was admitted within half an hour of the accident. He was considerably shocked on admission and was given morphine gr. ¼ and warmed with hot blankets, his temperature being 97·2° F. After 4 hours he had improved sufficiently to allow an anæsthetic to be administered.

Under gas and oxygen the whole of the large lacerated wound of the leg was excised and the small comminuted unattached portions of the shaft of the tibia were removed. The anterior tibial artery was completely torn across but as far as could be ascertained the posterior tibial artery was intact. About 4 in. of the middle of the shaft of the tibia was comminuted but there appeared to be enough bone fragments attached to the periosteum to allow union to take place. However, the possibility of gangrene was serious and it was decided not to put the leg up in plaster-of-paris for 3 or 4 days at least. The wound was cleansed with flavine solution and closed with interrupted silkworm-gut sutures. The leg was then put up on a double inclined plane splint with side pieces. There was little hæmorrhage during this operation, which was performed without a tourniquet.

The patient was comfortable next day (May 3) and the wound was not examined as the dressings were not soaked through. On the 4th the patient complained of headache and indigestion, for which aspirin was given, and his temperature rose to 101° F. About 56 hours after his accident he suddenly became unconscious with stertorous breathing. A lumbar puncture was performed and normal cerebrospinal fluid was withdrawn. The coma became slowly but progressively worse but at no time were there any localising signs; the pupils were small and fixed. The leg seemed satisfactory and it was not disturbed. The temperature remained at 101°–101·5° F. The patient did not recover consciousness and died 96 hours after his accident.

Autopsy.—The wound was clean and healthy with no sign of infection or gangrene. Sections of the brain showed multiple small hæmorrhages throughout the white matter. There was congestion of both lungs and the kidneys. Microscopical examination of the brain and lungs after staining with osmic acid revealed multiple fat-emboli.

CASE 2.—A soldier, aged 25, was wounded by a bomb explosion about 5 P.M. on Aug. 26, 1940. The patient and others were on the ground floor of a building when the bomb fell through the roof, the building collapsed and they were buried under the debris. It took some time for him and his comrades to be extricated. He was admitted to hospital at 8.55 P.M. and had previously been given morphine gr. ¼, 8000 units of anti-gas-gangrene serum and 3000 units of antitetanic serum. He was tall, well-nourished and well-developed, and was suffering from surgical shock and multiple wounds.

At 9.30 P.M. the same evening he was given anæsthesia of nitrous oxide, oxygen and ether. He had a large undermined wound over the right trochanteric region, which was excised and extensive débridement was carried out; the wound was closed after the introduction of gr. 15 of sulphanilamide and a flavine dressing applied. There was a lacerated wound over the middle third of the anterior surface of the left leg, this extended to a transverse fracture of the left tibia and fibula. This wound also was excised and débridement carried out; it was then closed by interrupted silkworm-gut sutures and a flavine dressing applied. A small puncture wound of the left thigh was treated with a flavine dressing. A small penetrating wound with muscle protrusion on the outer aspect of the right leg extended to a transverse fracture of the right fibula, and at the same level there was a fracture of the right tibia. This wound was excised and a flavine dressing applied. Both lower limbs were put up in mid-thigh plaster cases after manipulation on a Böhler's frame. During the operation 12,000 units of *Clostridium welchii* antiserum and morphine gr. ¼ were given. When recovering from the anæsthesia he had a good deal of vomiting. He regained consciousness about 3 A.M. and then slept until 5 A.M. when he had his bed made; he seemed bright and did not complain of pain. During the day (Aug. 27) his condition was deemed satisfactory, the plasters were comfortable, and there was no swelling or discoloration of the toes, which he could move freely. At 9 P.M. he complained of pain in his legs and was given heroin hydrochloride, gr. ¼, hypodermically. During the night the sister in charge thought he was a little delirious, disoriented and perspiring a great deal.

At 6.45 A.M. on the 28th he could hardly be roused, and was breathing heavily. Shortly afterwards, when examined by a medical officer, he was "hot, flushed and comatosed"; the toes were warm and the plasters seemed satisfactory. His breathing was stertorous and he had urinary incontinence; the pupils were equal and active to light and the abdominal reflexes were absent. At 11.30 A.M. his temperature was 101·4° F., pulse-rate 126, respirations 26. He was deeply unconscious, the face was flushed and slightly cyanosed; there was much sweating, especially of the face and forehead; breathing was stertorous and at times had Cheyne-Stokes rhythm. Heart beating rapidly, sounds clear. Blood-pressure 135/80 mm. Hg. Crepitations over lower lobes of both lungs. Abdomen normal. Pupils normal in size and reacted to light. At times there was conjugate deviation of the eyes to the left and at other times continuous horizontal movement of the eyes. Fundi and retinal vessels normal. Left upper limb a little spastic with slightly increased deep reflexes compared with the right side; abdominal reflexes not elicited. The lower limbs were in plaster and hence it was impossible to study their deep reflexes. Lumbar puncture performed; cerebrospinal fluid clear but under slightly increased pressure; 30 mg. of protein and 700 mg. of chloride per 100 c.cm.; colloidal gold test normal. Urine: sp. gr. 1026, acid, trace of albumin, sugar absent; deposit contained pus and epithelial cells, occasional red cells and large amount of amorphous urates.

At 2.45 A.M. on the 29th his temperature was 102·6° F., pulse-rate 150, and respirations 32 per min.; he was deeply unconscious and breathing stertorously. At 10 A.M. he was deeply unconscious and corneal reflexes were absent; pupils equal and reacted to light; no excessive perspiration; limbs felt warm, and petechial hæmorrhages were visible over the upper chest and shoulders. At 3 P.M. his condition was much worse; pulse-rate and respirations were much more rapid and moist sounds audible all over both lungs; temperature 103·6° F. He died in coma at 6.30 P.M.

Autopsy.—Petechial hæmorrhages on chest. Wounds as described. Rigor mortis present and post-mortem staining evident. *Skull and contents:* membranes somewhat adherent and congested. Cerebral convolutions congested. Petechial hæmorrhages present in white matter throughout brain including cerebellum; most marked in region of internal capsules. Brain weighed 66 oz. Skull normal. *Heart:*

some left ventricular hypertrophy; muscle healthy; valves competent; weight 17¼ oz. *Lungs:* congested, evidence of pulmonary œdema, probably due to widespread obstruction of capillaries and arterioles by fat-emboli. Numerous small fresh hæmorrhages on pleural surfaces over upper and lateral aspects of lower lobe of right lung and in anterior portion of upper lobe of left lung. No hæmorrhages in substance of lungs and no tears found. Trachea and bronchi congested. Pleuræ congested. Right lung weighed 36 oz. and left 32 oz. *Other viscera:* no pathological macroscopic changes.

Histologically the lungs showed evidence of consolidation with extensive exudate into the alveoli consisting of fluid and red blood-cells. Numerous fat particles of various sizes stained black scattered throughout the tissue; some in the pulmonary capillaries and arterioles, and others in the alveoli (fig. 1). Brain shows evidence of perivascular inflammatory reaction; little change in grey matter; pericapillary hæmorrhage in white matter, with areas of necrosis surrounding vessels; early degenerative changes in myelin sheaths. Fat-emboli in cortex and medulla and cortical blood-vessels (fig. 2).

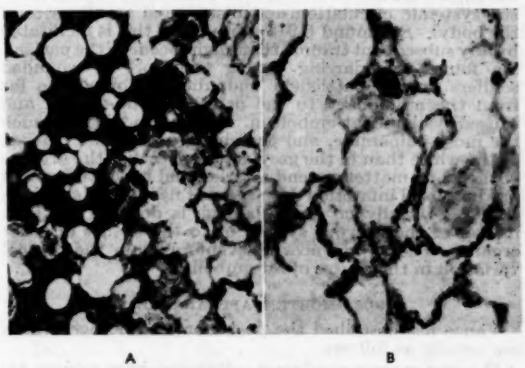
A CASE WHICH RECOVERED

CASE 3.—A labourer, aged 43, while superintending movements of trucks in a dockyard at 2 P.M. on June 21, 1940, got trapped between a door and a truck and injured his left thigh. He was taken to see the medical officer and was found to have a fracture of the left femur; he was put up in a Thomas splint and given morphine gr. ¼. At 4.20 P.M. he was admitted to hospital, temperature 97·8° F., pulse-rate 64, respirations 20.

Next morning his temperature was 100·8° F., pulse-rate 84, and respirations 25. Radiological examination showed a transverse fracture of the left femur, with slight medial displacement of the lower fragment and about ½ in. overlap. At 11 A.M. he was given Pentothal anæsthesia (14 c.cm. in 5% solution). Kirschner's wire inserted through lower end of the femur and the limb replaced in a Thomas splint and Balkan frame with 15-lb. traction; anæsthesia lasted 40 min. and recovery from it was uneventful. He had not passed any urine by the evening and hence a catheter was passed and 32 oz. withdrawn. Temperature 101·5° F., pulse-rate 100, respirations 28. At 7 P.M. he was comfortable and spoke intelligently to the nursing staff. During the night he passed 6 oz. of urine naturally.

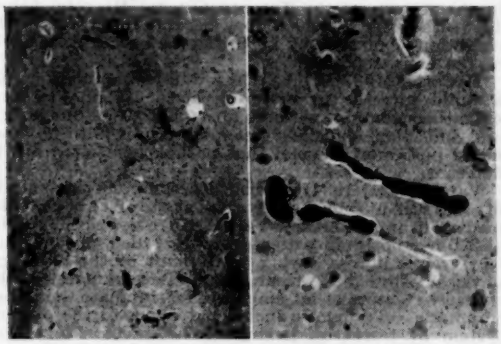
On the 23rd he woke up at 3.30 A.M. and told the nurse he felt very hot and asked for one of his blankets to be removed. At 5.30 A.M. (39½ hours after the accident) he could not be roused. He was unconscious, incontinent of urine and his breathing was stertorous; the pupils were equal and active to light; the limbs were held in flexion but he moved his right arm slightly while he was being examined; the abdominal muscles felt rigid and the abdominal reflexes were absent; the knee-jerks were present and the plantar reflexes gave doubtful extensor responses. At 7 A.M. his skin was moist and he was unconscious. Heart sounds were clear. Blood-pressure 110/80 mm. Hg. Pupils equal and active to light, fundi and retinal vessels normal; right knee-jerk accentuated compared with left; right plantar reflex extensor and the left doubtful. Urine: acid, trace of albumin, sugar and acetone absent; deposit contained a few red cells.

On the 24th, at 7.45 A.M. (26 hours after onset of coma), he showed slight appreciation of the presence of his relatives at the bedside, but he was unable to speak to them. On the 25th at 8.10 A.M. he could be roused and answered "yes" when asked whether he would like a drink, but he immediately relapsed into unconsciousness. During the second, third and fourth days after admission he had a good deal of abdominal distension. On the 26th his general condition was improved, but he resisted any interference and examination. Pupils were equal and active to light, the pulse-rate varied from 80–58 per min., the right plantar reflex was still extensor and the left doubtful. On the 27th his condition remained the same. In the morning of the 28th he spoke for the first time after his attack and answered questions. On the 29th he was speaking and answering questions, and both plantar reflexes were now flexor. On July 4 he was much better and talking reasonably. On the 9th another radiological examination was carried out; the position of the fragments was much improved, the overlap had been corrected and the alignment was good. On the 27th a further radiological report said that callus formation was beginning in the left femur and alignment was good. On Aug. 8 he was put in a Whitman's plaster. On Aug. 16 he was walking about the ward, and on the 30th he was discharged home still in plaster.



A B

FIG. 1—Case 2. Microphotographs of lung stained with osmic acid, showing fat-emboli. (A × 90, B × 130)



A B

FIG. 2—Case 2. Microphotographs of brain stained with osmic acid. (A) fat-emboli in cortex and medulla (× 45). (B) blood-vessels in cortex containing fat (× 200).

This man had pyrexia and increased pulse-rate for 11 days and increased respiratory rate for 5 days. The pyrexia came down by lysis to normal from the 3rd to the 11th day after the onset of unconsciousness.

He was readmitted to hospital on Sept. 27. His general condition was then very good. His left leg was still in plaster but he was able to walk well with a stick. Heart, lungs, abdomen and nervous system showed no signs of disease. Blood-pressure 140/90 mm. Hg.

ÆTIOLOGY

Our knowledge of fat-embolism extends back to the experimental work of Lower (1669), who injected milk intravenously into dogs and Magendie (1821–1836) who studied the effect of injecting oil into the circulation in animals. It was noted that the globules caused mechanical obstruction in the smaller blood-vessels. Wagner (1862) reported the first series of cases of fat-embolism in man; he quoted 48 cases, 15 of which resulted from compound fractures, 12 from acute suppurative lesions of bone and 15 from severe injury to bone or soft tissues.

A large number of clinical and experimental observations have been made to elicit the factors controlling the incidence of fat-embolism. It is said to be eight times more frequent in men than in women, and most common during the third or fourth decade of life. This could be explained because men in those decades are more liable to trauma than women. It rarely occurs in children under the age of 14. Harris, Perrett and MacLachlin (1939) reported 12 cases of fat-embolism, 6 of which ended fatally. They point out that recognition is not easy and is missed in many cases, even when the patient dies, because the presence of fat-emboli will not be detected unless the sections are prepared by special methods; in cases which recover, the clinical picture is not clearly defined or easily recognised. They also noted that the diagnosis of fat-embolism did not occur

in the records of the Toronto General Hospital before 1935—the year in which they became interested in the condition—but that by 1939 they had recognised all 12 of the cases reported.

McCarter (1937) thinks that a well-fed population, and a rapid increase in motoring accidents and surgical operations combine to force fat-embolism on our notice, and adds that clinicians generally expect it to be diagnosed post mortem, and that pathologists often fail to detect it.

Vance (1931, 1934) published a comprehensive study of cases seen at routine necropsies at the office of the chief medical examiner of New York. He reviewed the results of 246 necropsies in patients who had died as the result of physical injury, giving an account of the ætiology, physical signs and treatment. He summarised the causative factors of fat-embolism as traumatic and non-traumatic. Traumatic included trauma to the osseous system by fractures, jarring of the skeleton or orthopædic operations; and trauma to subcutaneous and intermuscular fat and fatty viscera, including injury by burns. He classified as dubious such non-traumatic factors as certain poisons, diabetes, injection of oily substances, eclampsia and childbirth.

The greatest number of the traumatic cases follow fractures of the long bones, and especially those of the lower limbs, but the degree of comminution bears no relation to its incidence. Few cases have been described where the skeleton was subjected to severe jarring without fracture of the bones.

Beitzke (1912) mentions a fall on an amputation stump, Ziemke (1922) a fall from a height; Busse (1913) a heavy blow on the right knee. Records of operations on bones and joints have shown their association with fat-embolism with fatal results. Lucke (1880) described a case following resection of the hip-joint, Vogt one (1883) following resection of the knee-joint, Kirschner one (1924) following osteotomy. Colley (1893), Eberth (1898), Clarke (1927), and Cammermeyer (1937) have described several fatal cases following manipulation of joints. Flournoy (1878), Pinner (1883) and Buerger (1915) have described cases where injury to the subcutaneous and intermuscular fat have resulted in fatal fat-embolism.

Some cases of burns show fat-embolism at autopsy, but usually it is of minor importance and often attributed to associated injuries. The condition has been found, however, in connexion with death from various poisons. Groendahl (1911) has discovered it following poisoning by phosphorus potassium chlorate, potassium bichromate, potassium cyanide, and mercuric chloride, but he rather doubted any ætiological relationship between the poisoning and the embolism. Diabetes mellitus with lipæmia is alleged to cause coalescence of droplets of fat sufficient to produce fat-emboli; such cases have been described by Fischer (1922), Ebstein (1899), and Saundby and Barling (1882). Graham (1907) states there is no similarity between the microscopic appearance of the intravascular fat in diabetic lipæmia and true fat-embolism. Virchow (1886) and Warthin (1913) have mentioned injuries to the pelvic fat at childbirth as possible causes of fat-embolism.

Vance in his study concludes that 12–14% of cases of non-traumatic death may show a slight grade of fat-embolism, and that as a result a slight grade of fat-embolism cannot be considered a reliable indication of trauma. On the other hand, a severe or moderate grade of fat-embolism is the result of an intravital injury and when demonstrated post mortem is sufficient proof that the trauma occurred prior to death. In 59 cases of fractures of the lower limbs which ended fatally within 21 days from the time of injury, he found that 20% had severe degrees of fat-embolism, and in approximately 5% it was the cause of death. In 80% of the cases there were no embolic signs, or they were present in only a slight or moderate degree and would not account for the fatal issue.

Robb-Smith (1941) analysed the post-mortem findings in 115 accident cases admitted to the Radcliffe Infirmary, Oxford; 35% of the cases showed a severe grade of fat-embolism and in 25% of the cases was "the major fatal factor." He described (1938) a method of examining a fresh specimen of lung which he believes to be the readiest means of confirming the post-mortem diagnosis of fat-embolism.

MECHANISM

Much experimental work and many theories have been put forward to explain the mechanism of traumatic fat-embolism (see reviews by Vance 1934, Scuderi 1938, and Watson 1937). Blood-plasma normally contains 0·2–2% of fat, but in diabetes the blood fat may be up to 20%. The fat is so finely emulsified that the globules pass easily through the smallest capillaries. Fat is also present in most tissues of the body and in some regions it is accumulated in the form of depots or reserves for use elsewhere when required. The subcutaneous and perirenal tissues, the omentum, and the marrow of the long bones are some of the usual sites of the fat depots, and there the fat is held in the form of large globules within the cell-walls of specialised connective-tissue cells. Most writers believe that the depot fat in the marrow of the bones is the source of the fat in fat-embolism.

Watson (1937) points out that three conditions are necessary for the absorption of the fat into the circulation at the site of injury: rupture of the connective-tissue cells liberating the fat; rupture of neighbouring blood-vessels providing a portal of entry; and some other factor causing the free fat to pass into the circulation.

The first two of these conditions are present in fracture of the long bones. The tissues are lacerated and the fat in the marrow cells is liberated by the initial injury and by subsequent manipulation. The fat globules are often seen floating in the blood at the site of bone operation or compound fractures. The blood-vessels are ruptured in the vicinity of the injury, the arteries squirt more blood into the area, thereby increasing the pressure, while the veins remain open and absorb the liberated fat, possibly by venous suction. Gauss (1916, 1924) suggested that fat-embolism is more common with fracture than any other condition, because the blood-vessels are encased in a bony wall; hence they cannot collapse as elsewhere in the body, but remain open and form a ready portal of admission for the fatty mixture to the general circulation.

Fritsche (1910) found that ligaturing the veins of an injured limb did not prevent the occurrence of pulmonary fat-embolism and hence suggested that fat may sometimes enter the circulation by the thoracic duct. Gauss also thought that fat was absorbed by the lymphatics, but at a slower rate than the veins, and hence after initial fat-emboli from venous absorption, a subsequent fatal dose of fat might enter the circulation by the lymphatic system. Most authorities believe that lymphatic absorption does not play any real part in the causation of fat-embolism.

After the fat has reached the circulatory system it is carried along the great veins to the right side of the heart, where it mixes with the blood and hence increases its viscosity. It is carried to the lungs where small emboli are lodged resulting in local congestion, œdema, and small patches of inflammation. These cause interference with the pulmonary circulation and respiratory exchange, and hence produce dyspnœa, cyanosis and a fall in blood-pressure. In 25–30% of people there is a patent foramen ovale (Kaufmann 1911, Thompson and Evans 1930, McGinn and White 1936, O'Farrell 1938), and in these subjects the emboli may pass direct from the right to the left side of the heart. In the majority of patients the emboli are forced through the pulmonary capillaries to the systemic circulation and distributed to all parts of the body. Siegmund (1918) noted that this is facilitated by any subsequent trauma that might occur to the patient. He found that jarring during transport of wounded soldiers on the battlefield undoubtedly forced the fat from the pulmonary to the arterial blood-stream and caused systemic fat-embolism. The brain tissue is much the most vulnerable, and the changes are more marked in the white than in the grey matter, because the arteries of the white matter are end arteries, and hence the emboli produce local infarction with areas of necrosis as shown in case 2. Usually no great damage is done to the grey matter of the nervous system or to the tissues of other organs. These sequences of events explain the clinical variation in the course of fat-embolism.

POST-MORTEM APPEARANCE

Vance has described the post-mortem findings, which are usually as follows.

Skin and mucous membranes.—Petechial hæmorrhages are visible over the upper part of the chest, the shoulders and

anterior aspect of the neck, and sometimes in the conjunctivæ and soft palate (present in case 2). *Lungs:* often show the usual signs of death from asphyxia. Subpleural hæmorrhages are seen; the lungs appear voluminous, cyanotic and œdematous. On section, areas of congestion and œdema intermingle with aerated areas. Microscopically the alveoli contain inflammatory exudate, red cells and leucocytes. With appropriate staining many emboli are seen in the arterioles and capillaries. *Brain:* there is usually some congestion of the meninges and the brain substance. On section a large number of petechial hæmorrhages are seen scattered throughout the white matter especially in the region of the centrum ovale. Microscopically, fat-emboli can be demonstrated in the arterioles and capillaries in all parts of the central nervous system. The petechial areas show a fat-embolus filling a small arteriole, around which is a circular zone of necrotic brain tissue, again surrounded by a circular zone of extravasated red cells. *Heart:* streaky hæmorrhages are often seen beneath the serous pericardium and in the substance of the myocardium. Microscopically, small fat-emboli can be seen filling the arterioles and capillaries in these areas and causing minute hæmorrhagic infarcts. *Kidneys:* systemic fat-emboli invariably involve the kidney, though they usually do not show any characteristic changes microscopically. Large snakelike emboli are often seen filling the capillaries of the glomeruli on microscopic examination.

SYMPTOMS AND PHYSICAL SIGNS

The capillary bed of the lungs is the first obstructive area to fat after absorption into the blood-stream. Fischer (1914) pointed out that the lungs are capable of accommodating large numbers of fat-emboli, and it is only in severe cases that the embolism obstructs the pulmonary circulation. Payr (1900) noted that the patient will either die as the result of asphyxia from the emboli in the lungs or the emboli will be driven through the pulmonary vessels into the arterial side of the circulation where death will result from involvement of the brain or the heart. Hence two or three main clinical types are described—pulmonary fat-embolism, systemic fat-embolism, and, by some authorities, a cardiac type (Warthin 1913). But few of the cases conform strictly to any particular type and more often, as in the three cases reported here, the clinical picture indicates both pulmonary and systemic infarction.

Groendahl (1911) recognised two clinical varieties of pulmonary fat-embolism. In one of these, a few hours after trauma, large amounts of fat are absorbed rapidly, flood the pulmonary circulation, and the patient dies suddenly with clinical signs of acute œdema of the lungs. The other type develops more slowly, usually three or four days after the accident, and the patient during this interval remains quiescent or at the most shows a few signs of restlessness or anxiety; then a troublesome cough appears which may or may not be accompanied by blood-stained sputum; there are dyspnœa, cyanosis and signs of pulmonary œdema, and the respirations become stertorous and develop Cheyne-Stokes rhythm. The patient finally dies in coma, referable partly to the asphyxia and partly to disturbance of the cerebral circulation. The sputum, if appropriately stained, often shows fat globules; this has been regarded as pathognomonic but more recent work proves that fat globules are present in the sputum of cases of tuberculosis, pneumonia and various other toxic conditions.

Vance (1931) divided the symptoms of cerebral fat-embolism into three stages, which sometimes can be differentiated sharply but may shade imperceptibly into one another. In the first stage the patient is relatively comfortable and free from any complication; this lasts usually for 48–60 hours, but may fluctuate from 4 hours to 9 days, being the interval that elapses between the trauma and the onset of the first symptom. In our series, it lasted 56 hours in case 1, 36 hours in case 2, and 37 hours in case 3. Then follows the second or soporific stage, characterised by restlessness, tachycardia, precordial pains and dyspnœa. Shortly afterwards cerebral symptoms become manifest such as insomnia, loss of memory, disorientation and delirium, and after a variable interval the patient passes into the third stage of stupor or coma.

In cases 1 and 2 the second stage was non-existent; the patients were suddenly found unconscious and incontinent with stertorous breathing. In case 2 for some hours before the onset of coma the patient was noticed to be delirious and disoriented, and both here and in case 3 there was profuse sweating. Gauss (1916) published a series of 14 cases, in 11 of which there was violent delirium in the second stage, followed by coma.

The third stage is characterised by increasing coma and the appearance of many and varying neurological signs. There may be signs of cortical irritation, such as convulsions, muscular rigidity, and tonic contractures; or paralysis of various groups of muscles and changes in the superficial and deep reflexes, accompanied by loss of sphincter control. There is often irregularity of the pupils and interference with the light reflex.

In case 1 there were no localising signs and the pupils were small and fixed. In case 2 the pupils were equal and active to light to within 6 hours of death. At times there was conjugated deviation of the eyes to the left, and other times there would be continuous horizontal movements of the eyeballs. The fundi showed nothing abnormal. The left upper limb was spastic and the deep reflexes brisk compared with the right side; the abdominal reflexes were absent. Since the lower limbs were encased in plaster it was impossible to study the knee-jerks, ankle-jerks, or plantar reflexes. In the early stage of coma there was profuse sweating which later disappeared. In case 3, 2 hours after the patient was found unconscious, his pupils were equal and active to light; the limbs were held in flexion, the knee-jerks were present and the plantar reflexes gave doubtful extensor responses; 3½ hours after the onset of coma he had a definite extensor response on the right and the left was doubtful. The fundi showed no abnormality.

Cerebrospinal fluid.—The cerebrospinal fluid in uncomplicated cases of fat-embolism shows no abnormality except slightly increased pressure; there are few records in the literature of the examination of the fluid.

In one of McCarter's (1937) cases the C.S.F. was clear on two occasions. In one of the cases reported by Whitaker in 1939 the C.S.F. was examined and "results were negative." In Watson's (1937) case "normal C.S.F. was withdrawn with no definite increase in pressure." Vance (1934) described one fatal case of fat-embolism where the "spinal fluid was bloody," but at autopsy there was a fracture of the left orbit and a small laceration of the brain adjacent to the fracture, as well as typical signs of cerebral fat-embolism. In case 1 of our series the C.S.F. was normal. Case 2 showed slightly increased pressure; the fluid was clear and contained 30 mg. of protein and 700 mg. of chloride per 100 c.cm., no excess of globulin, and two lymphocytes per c.mm.; the gold test showed no abnormality.

Fever.—The patients are usually pyrexial, but the temperature may vary from subnormal to 106° or 107° F., and is generally about 103° F. Case 1 had a temperature of 101° F. for a few hours before he became unconscious and it remained at 101·5° F. until his death. In case 2 the temperature was 101° F. when he was found in coma, and later went up to 103·6° F. Case 3 had pyrexia 24 hours before onset of coma—at first 100·6° F. and then 101·5° F.—and it was 10 days before it came down by lysis to normal.

Cardiovascular symptoms.—Tachycardia is always present and increases with the pulmonary congestion and cerebral involvement. The blood-pressure is usually normal at first, at the onset of symptoms it may be slightly raised, but as the circulation fails it falls. In case 2 the pulse-rate was 126 at the onset of coma and then went up to 150; the blood-pressure was 135/80 mm. Hg. In case 3 the pulse-rate went up to 128; he had slight tachycardia (112–92) for the next 9 days; blood-pressure was 110/80 mm. Hg. No real investigation has been made of the electrocardiographic changes in fat-embolism and there are hardly any records in the literature. Sophian and Scharles (1938) described a case of fat-embolism with radiological changes in the lungs and abnormal cardiac rhythm, in which the first symptoms were severe air-hunger and precordial distress. No electrocardiogram was obtained during the height of attack, the first being taken about 24 hours later; "this showed a definite flattening of T2, which became quite positive 24 hours later." The patient made a complete recovery.

Hæmorrhages and blood-changes.—The skin and mucous membranes often show petechial hæmorrhages at the

time of onset of the stupor; they are usually present over the upper part of the chest, the shoulders, and anterior part of the neck. Groendahl (1911) first described them, and Vance (1934) pointed out that if discovered during life they are an excellent aid to diagnosis. He attributed their distribution to the facts that the blood-supply of the areas is derived from the subclavian arteries (which usually receive large number of fat-emboli) and that the dermis in this area is not as fibrous as elsewhere. Similar petechial hæmorrhages have been noted in the conjunctivæ, soft palate, gastro-intestinal tract and bladder. The blood-count, if there has been no excessive traumatic hæmorrhage, is normal but usually with the onset of the pyrexia there is leucocytosis up to 17,000 or 18,000; there are few cases on record, however, where routine blood examinations have been made. Sophian and Scharles (1938) mentioned that in their case shortly after the onset of symptoms of fat-embolism there was a sharp fall in the number of red cells and in the hæmoglobin so that internal hæmorrhage was suspected. Harris, Perrett and MacLachlin (1939) mention that a profound fall in hæmoglobin may be a valuable point in diagnosis in certain cases.

Excess fat in the blood.—Scuderi (1938) noted the opinion of several well-known physiological chemists that quantitative estimations of fat in the blood were beyond the ability of the average part-time chemist to carry out accurately, and that even when determinations were done in well-equipped laboratories by trained men the variations were so great as to render them of no real diagnostic value. The concentration of fat was also considered to be too small to produce any appreciable variations when examined by physical and spectroscopic methods. He then tried dark field examination for fat droplets in the blood, a method first used by Edmunds (1877), and later by Neumann (1907) and by Gage and Fish (1924). This line of investigation may prove to be useful but he gives no records of its application clinically.

Renal changes.—The kidneys are involved in most cases of fat-embolism, though they sometimes fail to show characteristic microscopical changes. The principal lesions are large snake-like emboli filling the capillary coils of the glomeruli, and less often in the vasa afferentia (Vance 1934).

Scriba (1880) first recognised that fat could be excreted in the urine and thought it reached there by a process of filtration into Bowman's capsule through the intact vessel wall. Ribbert (1894) said that the fat ruptures the glomeruli and thus gains access to the tubules, or it occurs as the result of secondary degeneration and destruction of the tubular epithelium. Scuderi (1934) said that a good amount of fat is secreted through the kidney into the urine and here the small globules of fat can be found in a centrifuged specimen stained with Sudan III, scharlach R or osmic acid. Later (1938) he said that detection of fat in the urine is difficult because the droplets of fat float on the surface of the urine and are thus not excreted from the bladder unless the last few cubic centimetres of urine are expressed. He concludes that only the last few c.cm. of catheterised specimens of urine are valuable for examination in cases of suspected fat-embolism; needless to say, oily lubricants must not be applied to the catheter.

Radiological signs in the chest may in future prove a valuable aid to diagnosis in fat-embolism, but further investigations of their value are needed.

Jirka and Scuderi (1935) published the results of experimental work in dogs and concluded that intravascular droplets of fat if present in sufficient quantity will produce changes detectable by X rays, though in 1938 Scuderi noted that in his experience radiography had never been used in the diagnosis of fat-embolism. Sophian and Scharles (1938) described radiological changes in the lungs of a patient 5 days after he had sustained a fracture of the right femur and 24 hours after the initial symptoms due to fat-embolism. The findings were a bilateral acute patchy type of pneumonic change throughout both lung fields; the patches were acute and a confluent type of consolidation appeared on the left side. A definite improvement was shown in the radiograms a few days later. Whitaker (1939) reported that in one of his cases a radiogram of the chest showed a few patches of consolidation scattered over both pulmonary fields and the general haziness often seen in cases of pulmonary œdema; this was about 40 hours after trauma and 12 hours after the onset of initial symptoms of fat-embolism. Kolmert (1939) described radiograms in 2 patients taken immediately the clinical picture of fat-embolism was definitely established. It showed "diffuse patchiness and cloudiness spread over the greater part of both pulmonary fields."

DIFFERENTIAL DIAGNOSIS

The diagnosis is made on the history of injury and the onset of typical clinical manifestations usually within the first 3 days after the injury. As a rule there is increasing pyrexia, tachycardia and dyspnœa, with crepitations over the lungs and petechiæ over the upper part of the chest, followed by restlessness, insomnia, delirium, stupor and coma, with no focal neurological signs. There will be radiological changes in the lungs, rapid decrease in the percentage of hæmoglobin, and possibly fat globules in the urine.

Shock comes on either immediately or within a few hours after injury and is characterised by subnormal temperature, cold clammy skin and lowered blood-pressure, contrasted with pyrexia, hot moist skin and normal blood-pressure in embolic cases.

Delirium tremens may be simulated by systemic fat-embolism, but there is usually a history of alcoholism and the patient is older; early dyspnœa and pyrexia are not so pronounced and the characteristics of the delirium are helpful in the differential diagnosis.

Cerebral complications by direct extension of head injuries in multiple wounds (such as extradural hæmatoma, and acute or chronic subdural hæmatoma) are distinguished by their clinical history, neurological signs and cerebrospinal fluid.

Subarachnoid hæmorrhage may resemble systemic fat-embolism because of the deep coma and the absence of localising signs. The cerebrospinal fluid will decide the diagnosis; it is clear in fat-embolism and contains blood intimately mixed in subarachnoid hæmorrhage.

Other cerebral lesions.—Intracerebral hæmorrhage occurs in older patients and associated with vascular hypertension. In some cases signs of meningovascular syphilis may be precipitated by a comparatively slight head injury and similarly cerebral symptoms may be initiated in old people who have medial arterial calcification. These conditions will not have the dyspnœa, pyrexia and moist sounds in the lungs in the initial stages.

Internal hæmorrhage.—The percentage of hæmoglobin and the number of red cells may fall rapidly in some cases of fat-embolism, suggesting internal hæmorrhage, but the clinical picture should decide the diagnosis—the pyrexia, and the respiratory rate and rhythm.

Septicæmia may be simulated by fat-embolism, but the time and mode of onset are usually different. Rigors are more common in septicæmia. Signs of œdema of the lungs occur early in fat-embolism and the petechiæ have a characteristic distribution over the chest and shoulders. Cerebral symptoms develop later in septicæmia and are more often accompanied by changes in the cerebrospinal fluid.

Bronchopneumonia may closely resemble pulmonary fat-embolism, but the physical signs in the latter are those of œdema of the lungs rather than of catarrh of the medium-sized and capillary bronchioles with areas of consolidation.

Pulmonary embolism (thrombotic) develop later than fat-embolism, usually during the second or third week after trauma and generally about the tenth day, and there are differences in the clinical history and physical signs. It is well to remember Speed's dictum with regard to the times of onset: shock, 3 hours; fat-embolism, 3 days; pulmonary embolism, 3 weeks.

Blast lung (pulmonary concussion).—In this condition the pulmonary symptoms are present immediately after the injury and the physical signs described are different from those in pulmonary fat-embolism. They are diminished diaphragmatic movements, emphysematous appearance of the chest, and impairment of percussion-rate at one or both bases with or without crepitations. In other cases movements may be diminished on one side and the breath sounds obscured by loud rhonchi and scattered coarse râles.

TREATMENT

The many suggestions advanced for the treatment of fat-embolism are mainly palliative or empirical. The following prophylactic measures have been suggested by various writers.

Unnecessary or rough handling of patients should be avoided; all fractures should be reduced early and

splinted immediately; manipulations should be as few as possible; if the condition of the patient permits he should be propped up in bed. Stimulants of various kinds have been recommended but their utility is doubtful.

The idea of saponifying or emulsifying the fat was first suggested by Czerny (1875), and Wegelin in 1923 advocated intravenous infusion of a 2% solution of sodium bicarbonate. Schanz (1910) advised the administration of large quantities of intravenous saline to wash the emboli through the capillaries, but subsequent experience does not support any of these therapeutic measures. Gold (1927) administered cholalic and desoxycholalic acid but even the smallest doses caused hæmolysis. Rappert (1939) injected animals intravenously with Decholin (sodium dehydrocholate) and Eupaverin simultaneously and succeeded in administering many times the lethal fat dose without any ill effects on the animals. He has suggested the administration of sodium desoxycholate intravenously in doses of 10 c.cm. of 20% solution; it must be given very slowly in a drip infusion every 2 hours. Robb-Smith (1941) records rapid improvement in the pulmonary condition of one case as the result of a single injection of 10 c.mm. but the patient later developed cerebral fat-embolism from which he died. This form of treatment is at present only in the experimental stage.

Administration of oxygen is helpful. Kolmert (1939) quotes a case of a man aged 25, in whom the condition ran a typical course after a fracture of a leg; the patient became unconscious and as an experiment it was decided to put him in an oxygen tent. The effect was a complete surprise—the cyanosis disappeared almost immediately and 3 hours later the patient was fully conscious and felt well. The treatment was continued for 4 days and the patient recovered. Oxygen can be administered by B.L.B. apparatus so that the concentration of oxygen in the alveolar air would be 80%. If facial injuries are present the patient would have to be placed in an oxygen tent.

When systemic fat-embolism has developed the treatment at present is entirely symptomatic.

SUMMARY

The clinical course of 3 cases of fat-embolism is described.

Fat-embolism is probably a more frequent complication of wounds of modern warfare than is realised. If the condition is borne in mind the diagnosis can be made from a careful clinical history and examination.

When the opportunity arises appropriate measures should be taken at autopsy to confirm or refute the diagnosis, and hence more exact knowledge would be attained about its incidence.

Many more observations are needed on the morphological, physical and chemical condition of the blood and cerebrospinal fluid; and electrocardiographic and pulmonary radiological changes demand careful study.

Further observations should be made on the effect of high concentrations of oxygen, and on methods which will increase the emulsifying power of the blood and hence diminish the size and obstructive power of the fat globules in the capillaries.

We wish to thank the Medical Director-General of the Royal Navy for his kindness in allowing us to publish the records of cases 2 and 3; Surgeon-Commander R. L. G. Proctor, R.N., for the report of the autopsy on case 2, and Prof. D. M. Blair of the University of Glasgow for the microphotographs.

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EVIPAN HYPNOSIS IN PSYCHIATRIC OUTPATIENTS

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Cases of functional nervous disorder encountered in the psychiatric outpatient department fall into five groups: states of anxiety and depression, hysterias, obsessions and psychosomatic disturbances. In the majority the psychogenesis is obvious and it is relatively easy to elicit or discover evidence of some acute or long-standing conflict, maladjustment or other difficulty. Superficial analysis, discussion, reassurance, persuasion and re-education constitute the treatment and usually suffice to re-establish, or adequately correct, the personality or behaviour disorder and thereby remove symptoms of neurotic origin.

In a proportion of patients, however, the psychogenesis is obscure and superficial psychotherapy fails to effect any benefit. By this I do not mean to suggest that the diagnosis is never in doubt. Patients are frequently referred from the wards and other departments of the hospital because subjective symptoms persist in the absence of objective findings, even those of radiological, biochemical and pathological investigations. In many such cases the presence of a neurosis is suspected and subsequently identified, but in others the absence of an obvious psychogenic factor, the sound personal and family history and the good personality of the patient tend to exclude such a diagnosis. Three reasons can be advanced for failure to ascertain the psychogenesis in a suspected neurotic illness.

1. The patient is not suffering from a functional condition.
2. The psychogenic factors may be unconscious, that is repressed (unconscious resistance).
3. The psychogenic factors may be consciously withheld (conscious resistance).

Cases falling in one or other of the above groups cannot derive permanent benefit from superficial psychotherapy, and although treatment by hypnosis has been found valuable in certain nervous conditions it is not applicable to neurosis in general. Formerly, the only satisfactory treatment for cases in groups 2 and 3 was that of psychoanalysis which, for obvious reasons, could not be under-

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taken in the outpatient department of a large general hospital. It was felt that some treatment was required intermediate between superficial psychotherapy and orthodox analysis, and some kind of investigation to explore the psyche a little more deeply than the former and render unnecessary the frequent attendances and duration of the latter.

The barbiturates can be adapted to fulfil these requirements. In suitable dosage a selective action is exercised on the cerebral cortex causing a clouding of consciousness and corresponding depression of the highest centres responsible for criticism and discretion. Conscious resistance is thus overcome, inhibitions are removed, and the emergence of forgotten or unconscious material is facilitated whereby obscure psychogenic factors may become apparent. Hearing and speech are not greatly affected and patients are therefore converted into calm and confiding subjects willing to express the most intimate details of their personal history. Further, a heightened degree of suggestibility can be maintained and a sort of artificial hypnosis is obtained in patients otherwise resistant. Such a technique is useful for the deeper exploration of the circumstances which have precipitated a breakdown and also to facilitate a suggestive form of therapy.

Horsley (1936), using a 2½% solution of Nembutal, found the resulting willingness of the patient, the release of inhibitions and the ability to recall experiences recent and remote made analysis relatively simple and speedy. In an hour the physician could obtain a quantity of relevant information which he would not have obtained in a month by ordinary methods. Using a 10% solution of Evipan Sodium I arrived independently at almost identical conclusions (Stungo 1938). Sargant and Slater (1940) found that lost memories could be quickly and conveniently recovered by giving up to gr. 7½ of Sodium Amytal by graduated intravenous injections. Dicks (1940) states that following anæsthesia with evipan and Pentothal patients display a suggestible euphoric state which is very suitable for psychological investigations. With the precautions he adopts these drugs are rendered safe even with outpatients. The method sometimes yields surprisingly rapid insight into depth mechanisms which are entirely forgotten by the patients in their normal state. Campbell (1938), using a 10% solution of evipan sodium, successfully recovered memory in cases of hysterical amnesia. I use a 10% solution of evipan sodium, although equally satisfactory results have been obtained with its equivalents—Sodium Soneryl, Narconumal, Hexanastab and Hypoloid soluble hexobarbitone.

TECHNIQUE

The drug is administered by intravenous injection and 10 c.cm. is considered an adequate maximum for one investigation. The subject is asked to count numbers from 50 in reverse order. The solution is injected (approximately) at the rate of 1 c.cm. per min. and that rate is maintained until the patient exhibits some confusion, skips numbers or starts counting in normal progression. This point is reached after 1–3 c.cm. have been injected depending on the age, stature, constitution and resistance of the subject. Coincidentally the patient may complain of feeling "muzzy," usually licks his lips and relaxes. Any tendency on his or her part to fall asleep should be circumvented. At this point the injection should be interrupted but the needle of the syringe is kept in position; danger from the formation of small thrombi is negligible. The investigation can be initiated either by attention to the patient's spontaneous observations or by active questioning on the part of the physician. The pre-anæsthetic state is maintained by injecting at the same slow rate just enough of the solution to maintain that state.

The patient, released from inhibition, may discuss items, incidents or reactions which in normal consciousness were denied, suppressed, distorted or evaded. From time to time repressed material is spontaneously expressed. In the absence of spontaneous speech conversation should be encouraged by asking simple questions. In this way rapport is established. Diction should be clear and deliberate, the phraseology short and simple. Once initiated conversation is readily maintained and items of importance and significance can be discussed. Drug addicts and alcoholics require relatively larger quantities of the solution. The degree of response to the barbiturates depends also on the intellectual, cultural and social qualities of the patient. Should strong resistance to questioning be encountered it is advisable to anæsthetise the patient with the minimal anæsthetic dose. When signs of returning consciousness appear efforts to engage the patient in conversation should be renewed and are frequently successful. Should the investigation be negative the post-hypnotic period of heightened suggestibility can then be utilised for purposes of positive suggestion, persuasion and re-education. When positive results are obtained, the post-hypnotic period is also useful for synthesis and interpretation reinforced by suggestion and persuasion. In the event of abreaction (release of emotional tension) being excessive, the patient can be anæsthetised and allowed to sleep off the effects of the barbiturate. In such circumstances he would have no knowledge of any disclosures confessed or recalled under the influence of the drug. An attempt to negotiate the episode associated with excessive abreaction can be made at a subsequent session. The repeated administration of barbiturates in this way does not lead to addiction or other harmful effects. Idiosyncrasy is rare and contra-indications—such as advanced cardiac, pulmonary hepatic or renal disease—few. The effects of the drug pass off quickly and patients are quite capable of leaving the outpatient department or consulting-room, if necessary unescorted, after a rest of two or three hours. One nurse can provide all the necessary assistance required during the administration.

CASE-RECORDS

Of 208 patients referred to the psychiatric outpatient department of St. George's Hospital, 40 (19·2%) were selected for evipan investigation. In 36 of these the previously obscure psychogenesis became clarified and the diagnosis (of neurosis) was verified as a direct result of the evipan administration. The following abbreviated reports of 4 typical cases illustrate the value of the method in overcoming resistance so that the physician can obtain that additional information relevant for adequate understanding and treatment of the patient.

CASE 1. Conversion hysteria.—Female, aged 22, complained of "terrible pain under the left breast," duration 6 months, onset sudden. She was the eldest of five, had a happy childhood and a good work record. She was married, had one child aged 3 and she stated that she was quite content and free from worry. Her previous health had been good. She thought her heart was bad. Evipan investigation revealed that 6 months previously she had syringed with a whirling spray in an attempt to terminate a suspected pregnancy. She had inserted the nozzle until it caused her pain. She fainted and believed that she had injured her heart.

CASE 2. Anxiety state with compulsive features.—Female, aged 28, complained of vague fears, a feeling that she was going off her head, unwillingness to handle a knife because of the impulse to cut her throat, restlessness and inability to concentrate. Duration of symptoms 6 months, onset sudden. She was the fifth of six siblings, the family and personal history were good. She had a happy childhood, did well at school, had a number of jobs, and was never sacked. She had been married 5 years to an engineer, was disappointed that she had no family, but was otherwise content. She could in no way account for her symptoms. Under evipan hypnosis she expressed resentment against her mother-in-law and stated that she would like to creep up behind her and knock her out. Constant references by this woman to a former rival were disturbing and distressing to the patient. The symptoms had come on suddenly when she was reading police court reports in a newspaper.

CASE 3. Anxiety state.—Male, aged 27, a mortuary attendant, complained of fortnightly attacks of giddiness, headache and weakness in the legs which would come on suddenly while he was at rest. Duration 3–4 months. He was the second of six children, his family history and previous health were sound. There were no early neurotic traits; he had a happy childhood and a good school record. He had been in his present job for 2 years, had been married for 20 months, practised coitus interruptus, had no family and was quite content. His attacks lasted for two or three hours and he had no idea to what they could be attributed. Under evipan hypnosis he discussed his fear of impregnating his wife, which sprang from the fact that several women who had died

in childbirth had been admitted to the mortuary. He always worried lest his contraceptive measure should fail him. He awaited each of his wife's menstruations with anxiety. His attacks consistently arose on the day following coitus.

CASE 4. Effort syndrome.—Male, aged 29, complained of "terrible palpitations, indigestion and wind." Duration of symptoms 12 months. He was the younger son of a farmer in good circumstances and had had a happy and healthy life. His father was a man of fine principles and ideals. On account of depression in agriculture the patient emigrated to Australia where he successfully established himself as a farmer. He gave overwork as the reason for his breakdown. A doctor whom he had consulted said he had damaged his heart and he had accordingly returned to his home for care and attention. He maintained that he had no worries. Physical examination failed to reveal any sign of heart weakness. Under evipan he disclosed that as a result of his extravagance in Australia he started to do badly and was compelled to undertake Government contract work of a very arduous nature (clearing bush land). He had established a liaison with the wife of his friend and she had died soon afterwards as the result of an accident. One night as he lay in bed thinking of the mess he had made of things his heart started to thump and he thought he was going to die. The conversion of his anxiety into a cardiac syndrome enabled him to return home to England without loss of caste.

In the 4 unsuccessful cases no additional information was vouchsafed as a result of evipan investigation. The first, a patient with fits suspected of being hysterical, was subsequently diagnosed as epilepsy. In the second, a case suspected of being hysterical amnesia, failure to recover the patient's memory by means of evipan was later explained by the fact that the amnesia was due to concussion. This diagnosis was subsequently corroborated by the appearance of bruising and a hæmatoma of the scalp. Cases of amnesia due to concussion cannot be overcome by any known means, but where in addition there is an hysterical elaboration of the amnesia evipan can be used with advantage. In the third, a case of dermatitis artefacta, no psychological cause was found and the patient was referred back to the skin department for reconsideration of the diagnosis. The fourth was a case of enuresis and was treated by post-hypnotic suggestion with gratifying results.

After evipan hypnosis patients are asked to report for the psychotherapeutic application and evaluation of the material disclosed by the analysis. This they readily do, for the practical nature of the therapy is appreciated. In many cases of gross hysterical disability—such as amnesia or paresis—a single evipan administration has succeeded in removing symptoms or recovering function without the aid of psychotherapy. Herein lies the importance of keeping the patient as lightly narcotised as possible, thus enabling him subsequently to recall the information disclosed during the administration or to witness restoration of function. Orthodox analysts may insist that such therapy is purely a covering one, that the benefit is transitory and relapse inevitable. Even if this were true, the prompt removal of neurotic symptoms is valuable therapy and tends to preclude the fixation of symptoms and the development of secondary symptom elaboration, cases of which exhibit a resistance to treatment directly proportional to their duration. Patients are naturally asked for their permission before an evipan investigation is undertaken. In only one instance was this refused, the patient concerned being a prostitute.

A follow-up of the 22 cases who replied to an inquiry from 6 to 18 months after their last attendance gave the following result :—

Free from symptoms ..	11	Under other care ..	1
Improved	6	Unchanged	4

(Of the 4 "unchanged," 3 failed to return after the first attendance.)

Freedom from symptoms for such a short period cannot be regarded as necessarily indicating recovery, but the fact that 11 patients remained free from symptoms demonstrates the value of the method. Treatment by direct hypnosis was used extensively with good results during the last war but was naturally restricted to those patients who were hypnotisable, a relatively small number. By using evipan, however, 95% of patients can be narcotised, and as there is no practical distinction between the hypnotised and the narcotised patient there seems to be a good case for the wider application of evipan narcosis.

SUMMARY

Evipan analysis is a useful and rapid method of investigating cases of suspected neurosis in which no obvious psychogenic factor has been discovered or elicited by other methods.

Should the psychogenesis become apparent the hypnotic state induced by evipan is useful for treatment. Synthesis and interpretation may be attempted during the preanæsthetic or posthypnotic phases depending on the reaction of the patient to the drug.

Failure to identify the psychogenic factor by this means tends to rule out a diagnosis of neurotic illness.

A single dose of evipan has frequently restored function in cases of hysterical amnesia and paresis without the aid of psychotherapy.

I am indebted to Dr. D. Curran, psychiatrist to St. George's Hospital, for giving me opportunities to apply this method and for his advice and criticism.

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Medical Societies

ROYAL ACADEMY OF MEDICINE IN IRELAND

AT a meeting of the Section of Obstetrics on March 14, with Dr. R. M. CORBET, the president, in the chair, a review of some of the

Causes of Maternal Death shortly after Delivery

was read by Dr. J. C. GALLAGHER. This was based on the deaths from hæmorrhage and shock in the Dublin maternity hospitals during the past five years. Only a few deaths were directly due to hæmorrhage, so that the majority could be included under the heading "obstetric shock" as defined by Sheehan. There were 52,000 deliveries with 248 deaths, 74 of which were due to shock and hæmorrhage. A careful study was made of these deaths to find if there was any commonly recurring factor. Anæmia was the main factor in 6 deaths and an important factor in 8 others. The remedy is more widespread antenatal care and better all-round nutrition among the poor. Antepartum hæmorrhage was a factor in 25 cases—12 patients died of shock due to abruptio placentæ, external accidental hæmorrhage was responsible for 5 deaths, and the bleeding of placenta prævia for 8. Both transfusion and section received fair trial in these patients. The fatality of manual removal of retained placenta was 11–15%; there were 30 deaths after this operation, 5 of them from sepsis. Death was apparently due to shock in 25 of the cases of manual removal; in 18 of these there was no postpartum hæmorrhage and the second stage was normal. The use of plasma transfusion might better the results. Credé's expression and intracordal saline were associated with 2 deaths each. Postpartum bleeding occurred in 22 cases and was severe in 6. Among the deaths there were 7 cases of cæsarean section, 19 of forceps delivery (5 failed forceps), 6 of craniotomy, 9 of version and 1 of breech extraction. There were 7 cases of ruptured uterus and 1 of acute inversion. In conclusion Dr. Gallagher said that many of these patients were admitted in a moribund condition so that the mortality will only fall when many problems outside of the hospitals are settled.

Dr. BETHEL SOLOMONS said that, with few exceptions, the term "obstetric shock" as a cause of death should not be used. As a rule it meant that the obstetrician did not know the cause. Research aiming at lowering the mortality from these diseases would be hampered if statistics showed that shock was the cause of death and not the disease itself. Although there might be a rare unexplained fatality, most could be determined after thorough investigation. He regarded manual removal of the placenta as a failing of the junior obstetrician. As more experience was acquired, the number of removals would fall, and with it the morbidity and mortality.

He was surprised to hear that cæsarean section was still often done for concealed accidental hæmorrhage, for conservative measures gave better results. He asked if many of the manual removals were done for primigravidæ, for a really adherent placenta rarely occurred at a first birth. If pituitary extract were given after the placenta was delivered pituitary shock would not occur. He hoped that the injection of submammary saline was still taught for district work.

Dr. T. M. HEALY agreed with Dr. Solomons that obstetric shock was rare, but this fact did not get the obstetrician out of the difficulty of defining the condition from which the patient died. Dr. Gallagher in his paper had not mentioned the word trauma or injury at all. He thought that a great many of Dr. Gallagher's cases were due to traumatic shock. During his period as master of the Coombe Hospital he had tried in the annual reports to avoid using the term obstetric shock as far as possible, but it was exceedingly difficult to know what some of these patients died from. Obstetricians would welcome an explanation of why when patients bled into their tissues, or into the peritoneal cavity, they got into such an extraordinary state of collapse after such a small hæmorrhage.

Dr. O'DONEL BROWNE said that obstetric shock undoubtedly existed as a very terrible clinical entity, and he stressed the necessity for sharp distinction between it and the collapse or shock which supervened in the presence of excessive bleeding. In the production of shock ill health prior to the confinement, prolonged labour, misapplied obstetric operations and bad obstetrical judgment, with exposure to cold and long anæsthesia, were all important, but of themselves they would be unlikely to precipitate the condition unless some tissue damage took place concurrently. He maintained that judicious use of posterior-pituitary preparations was a great asset in the treatment of shock. His own experience of traumatic postpartum hæmorrhage did not include a single case where suture was necessary to control bleeding from a torn cervix. He had seen several cases in which the cervix had been badly torn, and this raised the question in his mind as to whether the cases treated by cervical suture were not in reality examples of incomplete uterine rupture.

Dr. A. SPAIN said that many of these patients died from shock which was in no way different from shock due to other causes. In describing these cases it was necessary to use the word shock, but it was not necessary to use the word obstetric. He thought that manual removal of the placenta should often be done earlier than it was. He had had fatalities as a junior obstetrician by waiting too long.

Dr. F. W. DOYLE had recently seen a patient who died of what in his opinion was obstetric shock. She was seven months pregnant and the fœtus had been dead for about a fortnight. He had been called suddenly to see her, and when he arrived found that she was dead.

Dr. E. A. KEELAN felt there must be a small group of maternal deaths which had their inception in the first stage of labour. This applied particularly to primiparæ, who, through want of adequate rest and sleep in the first stage, or on account of being given unsuitable food which provoked vomiting, or as a result of directions given by the nurse to bear down long before the os was fully dilated, became so fatigued that the second stage had to be terminated prematurely. A difficult forceps extraction might lead to profound shock in such a patient; a superadded small hæmorrhage in the third stage might sometimes cause death.

Dr. D. F. HANLEY was of the opinion that shock must be looked on as a secondary condition following some primary damage.

The PRESIDENT, from a study of the records of the Coombe Hospital for the last five years, suggested that patients who died shortly after delivery could be grouped into three classes: (1) patients suffering from organic disease associated with pregnancy (9 deaths); (2) patients suffering from some grave abnormality of the pregnancy itself (8 deaths); and (3) patients who had no complications prior to the onset of labour (1 case of hæmorrhage from rupture of the uterus, 1 case of pulmonary embolus after spontaneous delivery, and 4 cases of obstetric shock). The term obstetric shock should be strictly reserved for those who have an atraumatic delivery, and who develop shock and collapse without postpartum hæmorrhage. He had seen a multipara have a rapid spontaneous delivery unaccompanied by any hæmorrhage, go into a state of collapse in a few minutes, and in spite of every endeavour, including blood-transfusions, remain in this collapsed state and die. The placenta in this case was retained, and was manually removed as part of the exploration of the uterus to determine that internal hæmorrhage was not taking place. He pointed out that manual removal of the placenta was undertaken in two very different types of case. In the first, postpartum hæmorrhage due to partial detachment of the placenta, provided the bleeding had not been severe and prolonged, manual removal was not in his experience associated with any mortality. On the other hand, in a patient who had developed shock without any adequate hæmorrhage to account for it, manual removal was associated with a high mortality, but he was not satisfied that this mortality would be improved by leaving the placenta in situ in these patients when their shock was becoming progressively worse. He agreed that manual removal of the placenta should be reduced to a minimum, but he thought that the real exhibition of judgment lay in doing it in time. He agreed that many of the cases put down as obstetric shock died of operative trauma.

Reviews of Books

Practical Orthoptics in the Treatment of Squint

(2nd ed.) By KEITH LYLE, M.D., M.Chir. Camb., M.R.C.P., F.R.C.S., assistant ophthalmic surgeon, King's College Hospital; and SYLVIA JACKSON, senior orthoptist, Royal Westminster Ophthalmic Hospital. London: H. K. Lewis and Co. Pp. 341. 15*s*.

ORTHOPTIC exercises in the treatment of strabismus and some forms and degrees of ocular-muscle imbalance have excited interest for several years. As with many new therapeutic measures its initial stages were marked by the enthusiasm of its protagonists and the condemnations of those who doubted its value. The passing of time, careful observation and cold judgment have helped to define its proper place in ocular therapeutics. Much of the routine work in this field both in hospital and private practice is done by young women of school certificate or matriculation standard who have studied in an orthoptic clinic of one of the hospitals for one year and have passed an examination recognised by the Orthoptic Board. This book is a sound practical contribution to the subject written by an ophthalmic surgeon and an orthoptist who have worked in a large orthoptic department. The second edition has incorporated some notes on the ætiology of strabismus taken from Bernard Chavasse's recently published edition of Worth's "Squint." In the chapter on instruments there is a description of Livingston's rotating stereogram and some of his ideas are set out in the chapter on heterophoria. A new chapter on adult cases of squint has been added, and the chapters on paralytic squint and ocular torticollis have been enlarged. The "standard of cure" approved by the Orthoptic Board is used. The appendix gives an outline in tabular form of all the cases seen and treated at the orthoptic clinic of the Royal Westminster Ophthalmic Hospital during 1938.

Text-book of Ophthalmology

Vol. III. *Diseases of the Inner Eye*. By Sir STEWART DUKE-ELDER, D.Sc., M.D. St. And., F.R.C.S., ophthalmic surgeon to St. George's Hospital, London. London: Henry Kimpton. Pp. 3470. £3 10*s*.

Volume III maintains the high standard of its predecessors. In these days such large compilations are generally the work of multiple authors but in this case a single writer has abstracted information from a large contemporary literature in several languages and set it out concisely and lucidly; this makes for continuity of style and an absence of overlapping. The volume covers diseases of the uveal tract, the retina, optic nerve, lens and vitreous; glaucoma and hypotony and intra-ocular parasites. The illustrations of the external manifestations of ocular disease, fundus paintings and microphotographs of morbid histological material are well chosen and good.

THE LANCET

LONDON: SATURDAY, APRIL 19, 1941

SHARING THE BURDEN

IT is not surprising that in these days of talk about conservation of man-power comparing eyes should be cast on all sorts of medical activity, and general practitioners will welcome the Minister of Health's circular, summarised on another page, in which he recognises that private practice has already been seriously affected by the calling-up of its younger members and suggests means whereby hospitals and the public-health service can help to supply the future needs of the Forces. At the same time it is good reading that the three Service departments are reviewing their own medical establishments and that a similar process is taking place in the E.M.S. The unexpected calm in which a large proportion of medical members of the Forces and of the E.M.S. have passed the first eighteen months of the war has no doubt led to discontent both among themselves and among those doing their work at home. Some young doctors in the Army have felt that they were wasting their time in an unscientific and uncomfortable world while their colleagues were gravitating into the comparative luxury of hospital life with its greater prospect of scientific work. Some of the doctors in hospital service, on the other hand, have found themselves short of clinical material, and many of them would gladly join the Army if they could, especially if they felt there was enough work there for them. The mechanism for adjudicating on the claims of the different services has, perhaps inevitably, left some bitterness, but the real difficulty has lain in the circumstances of the times.

The increasing needs of the different theatres of war must entail further calls from time to time on civilian doctors liable for military service, and the aim must be to explore every other source of supply before depleting private practice below the borderline of safety. As the Ministry of Health suggests, local authorities may be able to release a certain number of the younger members of their medical staff by pooling their public-health services, by making full use of women doctors for maternity and child-welfare work, by appointing general practitioners to part-time posts, and by ensuring that no medical man is doing work which could be done by a layman. Hospitals can help by enrolling foreign doctors made available by the Medical Register (Temporary Registration) Orders, by "upgrading" some of the 2500 final-year students who under supervision can well undertake (as they did in 1917–18) the duties of junior house-officers, more particularly on the surgical side, and by reducing to a minimum the numbers of young doctors holding A, B2 and B1 posts, while being ready to lend or borrow medical staff in an emergency.

The emergency hospitals have to decide how much staff is necessary to deal with the basic minimum of clinical material in quiet periods while providing sufficient elasticity to enable the staff in periods of peak load to carry on until adequate reinforcements arrive. Experience has shown that only use can preserve the resources of a hospital in the state of preparedness in which it can cope with a sudden rush of work. Probably the ideal is, during a lull, to have these hospitals functioning up to half their capacity, either by drawing patients from the Army or by providing hospital treatment for the civilians who would benefit from it but cannot get it under present conditions. On this basis a 600-bed unit with 300 beds occupied will require one senior and one assistant surgeon, one skilled anæsthetist, one senior physician, and at least one other assistant, primarily a physician but able to assist with surgical work during an emergency. One house-officer will be needed for each hundred occupied beds, three in all. Apart from the medical superintendent the medical staff will therefore total eight, with calls on the part-time services of a radiologist and consultants for special types of case. This seems to be the bare minimum if the hospital is to be ready to admit and treat at short notice 300 severely wounded people. A staff of this size will be in no danger of deteriorating from lack of work if the 50% quota is maintained. Apart from strict economy in numbers more might perhaps be done by selecting for the E.M.S. the physically unfit, those boarded out of the Army on medical grounds and even the over-age, but hospitals prepared to do major emergency work require a certain nucleus of fit and active staff, and the Army has itself expressed a desire that as many young graduates as possible should undergo a period of training in such hospitals as a preliminary to military service.

INFECTION FROM DUST

THAT many pathogenic bacteria can remain viable for days outside the body has been known since KIRSTEIN'S [1] original work, but discoveries that come before their time are apt to be lost and forgotten. FLÜGGE'S doctrine, promulgated at the beginning of this century, that respiratory infections are spread directly by moist droplets with an infecting range limited to 3–4 feet became generally accepted, and only recently has spread of infection by air-currents to greater distances been resuscitated as a probable alternative route. The relative importance of droplets, droplet-nuclei (very small infective particles suspended like smoke in the air) and dust in carrying infection is now under active investigation. BLOOMFIELD and FELTY [2] showed some years ago that patients suffering from scarlet fever and tonsillitis were unable to infect blood-agar plates held a foot in front of the mouth while the patient talked, laughed or coughed. Following up this work and using a series of five plates arranged on the quadrant of a circle so that the top plate was in horizontal line and the bottom plate in vertical line with the patient's mouth at a distance of a foot, HARE [3] found that streptococcal throat and nose carriers speaking or coughing in a horizontal direction expelled few organisms on the upper two plates and increasing numbers on the lower plates of the circle. Colonies of hæmolytic streptococci were scantily present on the plates in only 4 of 12 carriers tested, and appeared most often on the intermediate plate of the series (angle of 45°). Tests with the Wells air-centrifuge failed to show hæmolytic streptococci in the air

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2. Bloomfield, A. L. and Felty, A. R. *Bull. Johns Hopk. Hosp.* 1923, **35**, 115.
3. Hare, R. *Canad. publ. Hlth J.* 1940, **31**, 539.

expired horizontally from the mouth. From his results, HARE concluded that streptococcal carriers transfer infection, not directly by droplets or droplet-nuclei but by large infective particles, which, falling on floor or bed-clothes, become dried and are carried into the air again with bed-making and sweeping. The large numbers of diphtheria bacilli [4] and streptococci [5] found in the dust of wards lend support to this view, and in his letter of April 12 (p. 493) CRUICKSHANK demonstrated clearly the increase in aerial streptococci after bedmaking and the usual ward disturbances. It is difficult to prove that infected dust actually produces clinical infection. Opponents of this view might say that in the dried state these pathogens are so emasculated as not to be able to initiate infection. But guineapigs placed in the exhaust tunnels of sanatoria have developed tuberculosis, and instances of infection from dust have been recorded—there was the person who after sweeping out a cubicle vacated five days previously by a patient with streptococcal puerperal infection developed tonsillitis due to a streptococcus of the same serological type.[6] MACGREGOR [7] described an outbreak of puerperal sepsis which necessitated closure of the ward and which flared up again when the ward was reopened with a new nursing staff. Such an occurrence and the outbreaks of puerperal sepsis described by CRUICKSHANK and GODBER [8] are at least strong circumstantial evidence of the infectivity of dust. In the disinfection of wards care must be taken, as WHITE [6] showed, that formaldehyde fumigation is carried out thoroughly, or, if washing-down is preferred, that dust high up on window-ledges or lampshades is removed (see Dr. Glass's letter, page 524). Aerosols and ultraviolet light are relatively ineffective here. To minimise the amount of dust and prevent its dissemination in the air, blankets may be treated with liquid paraffin and floors with spindle oil [9]; the oil should be sparingly applied with a mop after all polish has been removed with soap and water, and fresh application made every 2, 3 or 4 weeks as required. But infected dust can be a vehicle for the spread of infection by the hardy pathogens only: it does not solve the problem of the transmission of cerebrospinal fever and other infections whose materies morbi cannot live for long outside the animal body.

THE CASE FOR MASS RADIOGRAPHY

IT can now be considered as established that a large number of adults (probably about 1%), who are free from signs or symptoms, present radiological pulmonary lesions of sufficient significance to make it inadvisable to accept their services either in the fighting forces or in industries working under the full pressure of war effort. The expense of mass radiology of millions of people would be considerable, but that the cost of failing to carry out such a survey is probably much greater is suggested by the experience of the firm of Phillips of Eindhoven, who found the cost of 100,000 radiological examinations to be little more than a third of the consequent saving in sick pay, treatment and pensions which followed a 71% diminution of the incidence of tuberculosis in their employees. In a recent paper, prepared for his presidential address to the Faculty of Radiologists, SHANKS [1] discussed the three possible methods of mass radiography. Full radiological investigation, although the most accurate, is ruled out on grounds of expense. Screen examination alone is laborious for the radiologist and provides no permanent record. Miniature photography of the screen image is in his view the method of choice, for it is inexpensive in materials and quick; at least 100–200 cases per hour can be photographed with one apparatus. It can be carried out by a lay technician, and forms a permanent record that can be studied at leisure by the consultant. The accuracy of miniature as compared with full-size films has been the subject of recent studies by DOUGLAS and BIRKELS [2] and by CLARK and his colleagues,[3] who conclude that the margin of error is so slight that not more than 1–2% of lesions, and these of minimal dimensions, would be missed by the miniature method. It must be remembered, too, as KAYNE [4] has lately reminded us, that even full-size radiographs may miss lesions which are in awkward situations. Fears have been expressed lest over-diagnosis and the branding as tuberculous of cases with insignificant apical scars should result from this method of investigation, but it should be realised that a positive finding on a miniature radiogram is merely an indication for full radiological and clinical investigation, the result of which would be the separation of these cases into three groups: (1) shadow of no clinical importance; (2) active disease requiring treatment; and (3) cases requiring observation, which should be temporarily rejected for service or employment involving heavy strain, but need not be notified or treated as tuberculous.

The entire Royal naval personnel are now being examined by miniature radiography every two or three years, suspects being re-examined with a full-size film. This welcome information was given by SHELDON DUDLEY, director-general designate of the R.N.M.S., at a meeting of the section of epidemiology, R.S.M., reported in our last issue (p. 481). Of the first 18,000 men examined (at a cost of less than 1*d.* each) about 100 were considered suspicious on the miniature radiogram, but a full-size film and observation in hospital reduced this number to 47, who were finally diagnosed as active and invalided out. Here, then, routine miniature radiography removed 2 sources of infection from each 1000 men examined. In these times of strain, when an increase in tuberculosis is to be feared, the arguments in favour of an extensive use of mass radiography are overwhelming. With early diagnosis we can now anticipate the arrest of the disease in the majority of cases; the spread of infection, facilitated by blackout and shelter life, can be reduced. In addition to these advantages it should be brought home to the authorities that besides increasing service and industrial efficiency each pound spent on such a scheme might be expected to save three pounds.

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5. Thomas, J. C. *Lancet*, March 29, 1941, p. 433.
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4. Kayne, G. G. *Lancet*, Feb. 1, 1941, p. 143.

REPEAL OF THE MEDICINE STAMP DUTIES

IN his budget speech in April, 1939, Sir JOHN SIMON surprised all parties in the House by announcing that he proposed to repeal the medicine stamp duties because they had become administratively unworkable, but the opposition to what was generally regarded as a retrograde step was so forceful that the Chancellor later decided to refrain from taking it. Now Sir KINGSLEY WOOD has revived his predecessor's proposal, though he implies that between now and September, when the repeal will take effect, legislation will be introduced to apply some other form of control to "maintain a fair balance between the interests of the pharmacists and of other vendors." This follows his undertaking, made last August when the Finance (No. 2) Bill was being considered in committee, to get the parties together and hammer out some reasonable solution, the parties referred to being the Proprietary Association of Great Britain, the National Pharmaceutical Union, the Scottish Pharmaceutical Federation, the Wholesale Drug Trade Association and the Pharmaceutical Society of Great Britain. It seems fair to assume that some reasonable solution has been found.

The medicine stamp and licence duties go back to 1783, and it is clear that the original legislation, although primarily an excise measure for raising revenue, was also intended to protect the public from the dangers arising from the indiscriminate sale of medicines. The tax was twofold, as it is today. It was imposed on all persons who sold medicines and were not regularly bred to the profession of doctors, apothecaries or the like, and secondly a duty was laid on the medicines themselves when sold by such persons. By exempting the persons who are now represented by registered chemists and druggists and the medicines sold by them the House of Commons of that time showed in no uncertain way their desire to set up a signpost directing the public to the trained vendor for their medicines. That principle has been confirmed in every subsequent act relating to the sale of medicines. There can be no doubt that removal of the duties without offsetting legislation would encourage those abuses which Parliament a hundred and fifty years ago hoped to discourage, and this is no time for helping the sale of secret remedies, or indeed for encouraging the sale of any medicines beyond the needs of the community.

It is true that the law as amended by various acts since the passing of the original one has given rise to anomalies contrary to common sense—the Chancellor describes it as a museum-piece of administrative complexity—but that is not a sound reason for scrapping an important principle, as the Chancellor of course recognises. It will probably be found when the new measures are introduced that they will reserve to qualified persons their present right to sell medicines recommended for specific purposes, but that they will not interfere with the practice by which ordinary shopkeepers may sell drugs which do not bear recommending labels or instructions as to dosage. When the bill comes before Parliament other interested parties besides those mentioned may well demand consideration, so that the bill may yet be a controversial one. The Government, however, is pledged to give the chemists a measure of compensation if the duties are repealed, and if that measure of compensation has not been translated into law by September the repeal is likely to be postponed. No doubt many pharmacists would like to press for the reservation to qualified persons of the retail sale of all medicines, whether "recommended" or not, but they should reflect that it was an attempt by physicians of a hundred years ago to prevent chemists and druggists from recommending medicine for gain which brought the Pharmaceutical Society into existence.

Annotations

MENTAL DISEASE IN A GENERAL HOSPITAL

PSYCHIATRY is the most nearly related to sociology of all the branches of medical science, and mental disorders in general can be regarded as the meeting ground of social and cultural affairs on the one hand and the human organism on the other. It has always been desirable that psychiatry should be as closely in contact with general medicine as possible, and there is no better way to this end than to arrange for mental disorders to be treated not in relative isolation but in the same institutions as physical ones. The York Clinic—the building of which at Guy's Hospital had been contemplated for some years before the war and has now been completed in spite of it—is the first psychiatric clinic in the country to be erected in the precincts of a great teaching hospital and to form an integral part of it. The part played by mental processes in many apparently physical complaints (the psychosomatic disorders) is increasingly recognised, and recent advances in the treatment of psychotic conditions have turned early treatment from a pious gesture to a practical act. The so-called stigma which is still attached to psychotic mental illness should be largely erased by a conjunction of general and psychological medicine, especially when treatment can be given from beginning to end within a general hospital, to which admission is as free and informal as in the case of physical diseases.

The building is of a pleasant modern type embodying the wide experience in hospital architecture of two firms,[1] as well as the special experience placed at their disposal by the Board of Control through their architect. It is designed to accommodate 42 patients, mainly in single rooms. The fact that many patients, being ambulant, will use the common rooms of the clinic as their home has made it desirable to provide as much day-space as possible. The ground floor is occupied by public rooms and offices, while the basement, in addition to a laboratory, contains the gymnasium and dining-room. The first floor is intended for the reception of psychoneurotic and psychopathic patients; the two middle floors are designed for the milder type of psychoses, are self-contained, each with an occupation room and a lounge. The top floor is reserved for the acute psychoses which require close nursing supervision. The roof provides both covered and open space. The anonymous donors operating through the York Trust have provided not only the building but a sum for limited endowment as well, partly in the hope that the clinic may start immediately after the war with a nucleus of free beds; these will supplement the half-dozen provided by the governors some years ago in the general wards for similar purposes. But most of the beds will be for paying patients at various rates since the clinic is to be nearly self-supporting. A part of the site has been generously provided by Lord Nuffield; the rest has been leased from the medical school.

The clinic will benefit the students, who are to share fully in its work; they will be able to coöperate in the inpatient treatment of all varieties of psychological

1. Messrs. Thompson and Walford and Messrs. Stanley Hall, Easton and Robertson.

illness, excluding those requiring certification, and to share in the treatment of adults and children in an outpatient department which before the war was one of the busiest of its kind in the country. Patients will come more readily at an early stage of their illness to a general hospital, and will have the advantage of easy access to first-class facilities in the other branches of medicine provided by a teaching school. The risk incurred in completing the building now will be well justified if, at the end of the war, it is able to begin its work at once.

DR. ALISON GLOVER'S RETIREMENT

BEFORE joining the staff of the Ministry of Health in 1920 Dr. J. Alison Glover had gained valuable experience in general practice, had spent two years as part-time school medical officer under the L.C.C., and six years as deputy M.O.H. for Islington. In 1929 he was promoted deputy senior M.O. at the Ministry, and in 1934 he succeeded Dr. Ralph Crowley as senior M.O. of the Board of Education. During this time he has made notable additions to our knowledge of epidemiology. In the last war he showed that overcrowding was a more potent factor than season in raising the incidence and carrier-rate of cerebrospinal fever. After that he turned to the purification of swimming-bath water, rheumatic diseases (witness the Milroy lectures), scarlet fever, tonsillitis, measles, poliomyelitis, naso-pharyngeal infections in public and secondary schools; finally his epidemiological observations on the first four months of evacuation were embodied in a presidential address to the section of epidemiology, R.S.M. These things are on record. Hitherto unrecorded are his love of classical poetry and his absorbing interest in lethal weapons. His office desk is adorned with relics of the last war, while in a drawer of the same desk is to be found a copy of Milton. And his actual experience of warfare is worth recording. While still a student at Guy's he joined the C.I.Vs. as a private and saw service in South Africa, gaining a commission in the New South Wales Medical Corps. During the last war he served as a regimental officer in France, as a sanitary officer in Malta, and ended up in charge of the cerebrospinal fever laboratory, London district. Now at the age of 65 he is serving as a private in the Home Guard; after a night of duty he will appear at the office in the morning as fit as if he had just returned from a holiday. Glover himself attributes his physical fitness to his love of two recreations—swimming and lawn tennis. An early dip in the Hampstead ponds was for many years part of his daily regime, summer and winter. Retirement will not mean lethargy, for Dr. Glover will be retained at the Board of Education for special services.

HYPNOSIS BY HYPNOTICS

THE use of narcotic drugs to discover what a patient cannot communicate because of hysterical and other psychological disturbance is not new, any more than is their use to discover what a suspected delinquent will not disclose. In neither instance can they be relied on; the patient or the criminal may keep his secret, or perhaps the story he tells while under the influence of the drug is a misleading fantasy. But it is not merely as an aid to mental exploration, a solvent of amnesia, that the narcotic method has its modest place in psychiatric procedure. It may be employed, as Dr. Stungo on p. 507 shows, much as hypnosis may be employed. Indeed, it was as a device for making hypnosis easier in resistant subjects that narcotic drugs entered this field. It is widely recognised that drugs, and especially placebos, can have a suggestive effect far more important than their pharmacological effect; and if a drug is used that, when given by injection, induces drowsiness and is preceded by the creation of an expectancy of "cure" in the patient corresponding to the confidence of "cure" in the doctor's mind and manner, the suggestive effect can be therapeutically powerful. That there are drawbacks and even risks needs no emphasis. Psychogenic factors disclosed may be irrelevant or fantastic, the catharsis trivial, the patient's misunderstanding of his illness or his symptoms all the greater; "narco-analysis" is not a treatment in itself but a technical aid to the carrying out of a regular psychiatric treatment whether it be brief or prolonged, re-educative or purely suggestive. The method is, in short, not one for indiscriminate use by those without psychiatric training. It is also important that the wider effect of narcotic and other drugs in mental disorder be borne in mind. It was, for example, the effect of Sodium Amytal on schizophrenic stupor that first made this drug conspicuous in psychiatric work. Yet none would be so hardy as to suggest that this effect of amytal was irrespective of its pharmacological action or had anything to do with suggestion. These drugs do not act in the same way in different forms of mental disorder, nor is their application a simple undemanding procedure, coming as a godsend for the harassed outpatient physician who is innocent of psychiatric subtleties and eager to clear up the patient's troubles by a Gordian-knot attack. That they save time in dealing with hysterics is perhaps the only justification for their having such terms as "hypnosis" and "analysis" tacked on to their names. There are many differences between sleep and hypnosis, and between either of these and narcosis; and to attach the word analysis, nowadays, to anything and everything in a psychological context is to go in for miching mallecho.

ELECTROPHORETIC COMPONENTS OF DIPHTHERIA ANTITOXIN

SOME attention has been paid during the last few years to the physicochemical changes occurring in the sera of horses undergoing immunisation. Important progress has just been reported by Kekwick and Record [1] of the Lister Institute, using the electrophoresis apparatus of Tiselius.[2] In normal horse sera four protein components can be demonstrated—albumin and three globulins, α, β and γ. As immunisation with diphtheria toxoid proceeds, the same four components are obtained, although the relative proportions of each become altered; in diphtheria antitoxic horse sera the antitoxin is associated with the β and γ globulins. By electrophoretic methods these components can be separated, and their properties compared with those of the sera from which they were derived. Quite early in the course of injections the percentage of globulin rises. The immediate reaction is the production of a relatively small amount of γ globulin antitoxin, the percentage of which remains fairly constant at a low level for most horses; but the main increase in globulin is due to the β constituent which is predominantly responsible for the antitoxic activity of most sera. The α globulin and albumin components are not antitoxic. A study of the β and γ globulins and of a number of diphtheria antitoxic sera containing them has been made by Kekwick and Record. These globulins possess a number of properties which distinguish them sharply from one another. From the immunologist's standpoint perhaps the most interesting distinguishing property of the separated β and γ globulins is the in-vivo/in-vitro ratio[3]: 0·9 for β and 2 for γ globulin. It has been noted that the γ constituent, with its higher ratio, develops early in immunisation, and in this connexion Glenny and others [4] previously observed that early bleedings from horses tend to

1. Kekwick, R. A. and Record, B. R. *Brit. J. exp. Path.* February, 1941, p. 29.
2. Tiselius, A., *Biochem. J.* 1937, **31**, 1464.
3. The in-vivo value of a serum is obtained from tests on laboratory animals, and the in-vitro value by the Ramon flocculation method.
4. Glenny, A. T., Pope, C. G., Waddington, H. and Wallace, U. *J. Path. Bact.* 1925, **28**, 463.

show a high in-vivo/in-vitro ratio, while the general tendency is for this ratio to fall as immunisation proceeds. The antitoxic γ globulin from a very limited number of horses showed the same avidity characteristics, suggesting that the γ globulin from these horses was of identical composition. But Kekwick and Record point out that occasional in-vivo/in-vitro ratios greater than 2 have been described, the origin of which is not yet clear. They also make the interesting observation that the nitrogen specifically precipitated by diphtheria toxin from antitoxic γ globulin is twice that precipitated from β globulin, although the molecular weight as determined by the ultracentrifuge is the same for both β and γ globulin. Much of this technical analysis will be heavy going for the uninitiated, but the suggestion that the γ globulin antitoxin may have some advantage therapeutically should not pass unobserved. The γ globulin antitoxin flocculates with toxin more rapidly than the β globulin, and appears to have greater avidity. Further research may show whether it is possible to produce greater amounts of the γ globulin during immunisation, and whether this special fraction is clinically more efficient.

CONTROLLED COUNTERIRRITATION

ALTHOUGH counterirritation has through the ages been one of the most popular ways of easing pain its use has been empirical, and little effort has been made to understand its undoubted efficacy. Heat, cold, rubbing and scratching have from time to time been superseded by more drastic methods such as cupping, the cautery or blistering ointments, and recently vibration and electrical stimulation have also been used. The experiments of Gammon and Starr[1] seem to explain some of the effects of counterirritation and to offer more effective methods for its employment. They produced prolonged pain in themselves with an irritant ointment rubbed into the skin and by subcutaneous injection of 10% sodium chloride, and they then observed the effect of temperature changes, vibration and of tactile and electrical stimulation. On the application of a counter-irritant the pain was lessened or abolished, but it soon began to return and had reached its original intensity within a minute. When the counterirritant was removed prompt relief again occurred, but the pain returned within a minute. When counterirritation was too strong a most disagreeable summation with the original pain resulted, and if it was too weak there was little effect on the pain. The best counterirritant was cold and it was most effective between 4° and 10° C., while heat was optimal at 40° C. Cold, electric stimulation, heat, tactile stimulation, vibration, and a jet of air were relatively effective in that decreasing order when applied to the pain produced by injection of hypertonic saline, but only cold was effective in easing the pain of skin irritation. As would be expected from their early results, they found that interrupted counter-irritation gave far greater relief from pain than did continuous stimulation. The effects produced were not dependent on vascular changes; on the contrary, animal experiment showed that streams of nerve impulses from pain receptors were interrupted by the counterirritation. Gammon and Starr then applied their results to 80 patients, and found that the majority preferred 40 seconds of heat alternating with 30 seconds of cold but the choice of counterirritant varied somewhat with the type and origin of the pain, and static electricity was sometimes surprisingly effective. They agree with Cushny[2] that counterirritants act centrally, especially as relief could be obtained by irritation remote from the source of pain, and they think there may be central depression taking place within the thalamus. This transitory central depression after stimulation may be similar to that recently described by Bronk.[3] Whatever the physiological basis for these observations, it is stimulating to find medieval guess-work giving place to the scientific control of pain through the coöperation of institutions for medical and for physical research.

1. Gammon, G. D. and Starr, I. *J. clin. Invest.* January, 1941, p. 13.
2. Cushny, A. R. Textbook of Pharmacology and Therapeutics London, 1924, p. 75.
3. Bronk, D. W. *J. Neurophysiol.* 1939, **2**, 380.

SHARING OUR RISKS

MANY good practices have been interrupted by bombs, and many others have melted away as towns are evacuated; hardship to individual practitioners has often been great. The Medical War Relief Fund, administered by a committee representing the Royal Colleges, the Royal Medical Benevolent Fund and the British Medical Association has already been able to distribute much-needed loans and gifts, so far amounting to £4000. A typical case is that of a doctor whose house and equipment were destroyed by an incendiary bomb; his income had fallen, owing to the war, so that he was only just able to carry on. The need for new clothes and equipment faced him with an outlay which was quite beyond his means, and the fund was able to make a timely loan. Another general practitioner rejoined the Army in which he had served in the last war, but was invalided out after taking part in the Dunkirk withdrawal. His practice had gone down in the interval and there was a gap between the date when his Army pay stopped and the date at which professional bills became due. He was helped with a gift and a loan. A number of doctors have been killed in raids which also destroyed the greater part of their property. Their widows, some of whom have children to rear, have received gifts or loans and have been helped to obtain pensions from appropriate sources. Loans are made free of interest and those receiving them have written warmly of their intention of paying them back as soon as their circumstances permit. All the same, applicants are bound to increase in number while the war lasts, and though contributions to the fund up to the end of March had exceeded £20,000 the drain on it is likely to be heavy. Every member of the profession is asked to contribute, and those who have not received a local appeal may send subscriptions to the hon. treasurer, Medical War Relief Fund, B.M.A. House, Tavistock Square, London, W.C.1.

THE MORTALITY OF HUSBANDS AND WIVES

MANY years ago Karl Pearson and his colleagues[4] observed a positive correlation between the length of life of husband and wife, an association they attributed mainly to "assortative mating" though they thought common economic backgrounds might well play a part. The subject has recently been taken up and extended, with value, to different causes of death, by Ciocco, who has studied the registers of death in Washington County, Maryland.[5] He finds not only a rather greater degree of association than the earlier workers in length of life but also evidence that husbands and wives, in the case of four diseases—tuberculosis, influenza and pneumonia, heart diseases, and cancer—tend to die of a common cause more often than would be expected if chance alone was operating. For example, when the husbands died of tuberculosis 17·1% of the wives also died from tuberculosis, but when the husbands died of other causes only 5·8% of the wives died from tuberculosis. Similarly when the husbands died from cancer 15·5% of the wives also died from cancer against 10·3% when the husbands died from other causes. With tuberculosis possible explanations are not far to seek: marital infection, marital selection and common economic levels may all play a part, though the relative importance of each cannot be determined. Influenza and pneumonia are also infectious diseases and influenced by economic circum-

4. *Biometrika*, 1903, **2**, 481.
5. *Hum. Biol.* 1940, **12**, 508.

stances. It is not so simple to suggest an explanation for the greater common incidences of heart disease and cancer. Marital contagion might be an element in heart disease if the causative factor in rheumatic heart disease is infectious; otherwise we can but fall back on conscious or unconscious marital selection of like by like in constitution. There is no evidence of a physical type for cancer, most workers deny an infective agent, and there remains, it seems, only the common environment including diet. This suggests a line of approach which merits further attention.

BLOOD SEDIMENTATION

TWO short articles by N. K. Basu in the *Indian Journal of Pediatrics* for January (p. 27) deal with blood sedimentation in relation to tuberculosis and vitamin-C deficiency. The experimental evidence quoted is too meagre to allow of any definite conclusions being drawn, but the papers are none the less interesting. Basu uses an unusual technique for measuring the B.S.R., inasmuch as the blood is diluted with saline to the extent of 1 in 50. This startling departure from common practice may serve as a reminder that the principal requirement of any technique is that it shall give results which show an accurate relation to clinical findings. It has been suggested that B.S.R. measurements are of value in the diagnosis of tuberculosis, and although this view is not generally held in this country, it may be that Basu's modification of the sedimentation-test gives the greater sensitiveness he claims for it. He also finds that the administration of ascorbic acid to tuberculous patients tends to improve the B.S.R. but he leaves it to others to decide whether this is accompanied by improvement of the patient. The sedimentation-test has had a long run, and it is time that the assessment of its clinical value was agreed upon. The ease with which the test can be performed has perhaps stifled clinical as distinct from laboratory research; or possibly the organisation of the collective research required has been dismissed as impracticable. The matter should not remain here.

STAMPING OUT HEAD LICE

WHEN medical inspection was introduced 34 years ago the formidable problem of the head louse was for the first time tackled systematically. Like so many drives in medicine and public health, the attack failed to achieve complete victory because of the success of its early battles. Within a few years the rate of infestations of the heads of school-children fell from nearly 90 to about 10% and the foulest disappeared. In some districts even better results have been obtained and of a few it may be said that the head louse is no longer resident and does not breed regularly; but these are few indeed. Lately the attack has been one of passive routine rather than active warfare and though it has kept the lousiness of the heads of school-children within reasonable limits in normal circumstances nothing has been done towards extermination. The Ministry of Health and the Board of Education have now issued a memorandum[1] on the subject which is timely, for though it might neither surprise, enlighten or help the first generation of school inspectors the present generation has largely forgotten the experiences of the past. The memorandum states that powers are available to local authorities which "should be adequate to secure the desired result." The experience of the past is that these powers are not adequate. The most important in theory is the power to cleanse verminous persons, but as this requires consent it is of no real value. For there never was any great difficulty in cleansing those who wished to be cleansed. As the head louse is a strict parasite and its habitat the hair of human scalps, success can be achieved only by action on this nidus, but to effect elimination all heads must receive attention. The chief reservoir of the louse has shifted from school-children to infants and young women, so the main attack should be shifted also to these fields where our powers are much restricted. Continuous instruction and education of senior girls is our chief hope, for if these are well trained they will keep their own heads clean when they leave school and look to the heads of their children in after years. But for complete success we must have compulsory powers to cleanse those who will not cleanse themselves. Now that the Board of Education and Ministry of Health have reawakened to the menace of the head louse, they may realise that the intermittent issue of circulars does not solve national problems.

1. Accompanying Circulars 2306 (Ministry of Health) and 1544 (Board of Education) to local authorities.

MINIMAL HEALTH REPORTS

CIRCULAR 2314 of the Ministry of Health is no more than a reminder that the reports for 1940 should be framed as laid down by circular 2067 which was the final instruction for the reports of 1939. Some of the reports for that year were nearly completed and many more had been commenced before circular 2067 was received in July, so they are a mixed lot, some being but slightly shortened and others stripped to the bone. It is to be noted that reports for 1940 are required, but they are to be as short as possible and to deal only with matters relevant to that year which were of public-health interest. Owing to the suppression of conferences, difficulties of communication and curtailment of journals, we have not the general knowledge of the public-health history of 1940 that we have usually at the end of a year, and are largely unaware of any points of special consequence or interest which may have occurred in the various localities. It is important that any such happenings as would be reported in ordinary circumstances should be recorded in the reports for 1940, especially in view of the exceptional difficulties in forecasting what is likely to happen in the epidemiological field in the years ahead of us. We are not prophets and cannot foretell the future, but we can deduce probabilities from evidence which we look to find in the annual reports for the past year. In present circumstances the most interesting information is that concerning outbreaks, or alleged outbreaks, of food-poisoning or food-spread diseases and unusual prevalence of diseases which are, or might be, connected with nutritional deterioration.

Prof. W. W. C. TOPLEY, F.R.S., has been appointed secretary to the Agricultural Research Council in succession to Sir Edwin Butler who is retiring through ill health. Professor Topley, who was appointed a member of the council last year, is director of the division of immunology at the London School of Hygiene, and since the outbreak of war has been guiding a national laboratory service. In this appointment we see an important development in the union of health and agriculture.

UNDER the new schedule all medical and dental students will be reserved from the date of acceptance by a recognised medical school, subject to satisfactory reports on their progress in study from time to time. The medical schools will, however, not have unlimited right of admission, but will be requested to adopt some quota in terms of recent entries.

WE regret to learn of the death, in London on April 10, of Dr. DAVID FORSYTH, consulting physician to Charing Cross Hospital and to the Evelina Hospital for Children. Dr. Forsyth was one of the early students of psychoanalysis and modern psychological methods. He was 64 years of age.

Special Articles

ALLOCATION OF MEDICAL MAN-POWER

THE Ministry of Health has sent a circular (No. 2323) to medical officers of health, local authorities and hospitals suggesting means by which they can help to meet the growing needs of the Services for doctors. Consideration of civilian and Service requirements by the ministers concerned has made it clear that further special measures are necessary if the limited numbers of doctors available are to be employed to the best advantage. The three Service departments are reviewing their medical establishments, and it is hoped thereby to reduce the further calls on doctors in civilian practice. The needs of the different theatres of war are, however, so great that such calls will still have to be made from time to time; these will be met as hitherto from practitioners liable to military service,[1] through the machinery of the Central Medical War Committee. The Minister of Health is reviewing the E.M.S., with a view to releasing for the Forces a number of whole-time and part-time members both by reducing the strength of the service and by replacing British members with foreign practitioners.

HOSPITAL STAFF

Hospital authorities are urged to take all possible steps to reduce their establishments of resident posts and to consider favourably the employment of foreign doctors. The Minister is also of the opinion that the time has now come, as in the last war, to employ medical students in their final year as junior house-officers (A posts), so far as is compatible with the law. By this means a number of present holders of A posts will be freed to perform the duties now carried out by senior house-officers (B2 posts) or junior medical officers (B1), who will thus be released for the Forces. In the interests of medical education, and to maintain a proper standard of treatment, students should be employed in this way only in hospitals where their work can be supervised by members of the teaching staff of the medical schools. It is considered inadvisable to replace more than half of the junior house-officers in this way, and normally students chosen for these appointments should not hold them for more than 3 months. For purposes of reimbursement the ministry will recognise honoraria of £50 a year, plus board and lodging not exceeding a further £100, for students employed in this way. Hospital authorities should feel that every hospital in the emergency scheme is a unit in a comprehensive organisation, so that they should help each other at times of special stress by lending medical staff. Practitioners who are enrolled in class 1 or 2 of the E.M.S. are at the disposal of hospital officers and group officers for this purpose, but the same principle should be extended by hospital authorities to their own staff. The services of additional junior house-officers are particularly valuable for relieving temporary pressure on hospitals, and the Minister hopes that requests for loans of staff will be met readily, without any question of invoking the compulsory powers vested in group and hospital officers under the defence regulations. The Minister has refrained from enrolling holders of A and B2 posts in the E.M.S. so that hospitals may have full liberty of action to move junior house-officers from one kind of work to another in the interests of their education, and in order to facilitate the flow of newly qualified men into hospital establishments.

PUBLIC-HEALTH OFFICERS

The Minister hopes that local authorities will consider the possibility of releasing members of their public-health medical staffs not holding hospital appointments. For example, the employment of a woman doctor on maternity and child-welfare work and the transfer of other functions to a general practitioner over military age might enable the authority to release a young member of their staff for the Forces. In some areas it may be possible to share the work of medical officers of health and their assistants between the officers of different authorities. Administrative and clerical duties not requiring to be directly performed by a medical man should be delegated to lay staff. There is no need for a medical officer to remain on duty at an A.R.P. control centre solely for air-raid purposes at a time when no alert has been sounded, and indeed his presence there is not always necessary throughout the period of an alert if he can be quickly summoned when required.

The circular concludes with these words. Private practice has already been seriously affected by the recruitment of practitioners of military age, and, if a fair balance is to be preserved and essential medical services carried on, other branches of medical practice ought to make further contributions to the Armed Forces. The Minister is confident that he can rely on public-health and hospital authorities to coöperate in meeting this urgent national need.

1. Only whole-time professors and lecturers over the age of 25 are reserved in the schedule of April 10, 1941.

UNITED STATES OF AMERICA

MALFORMED BABIES

THE New York State health department has been conducting an experiment in reporting. Since January 1940 birth certificates have had on the reverse a series of questions which the attending physician is invited to answer, but answers are not legally required. The questions are:

"Pregnancy, complications of:.... ; Labor, complications of:..... ; Weight of baby at birth ..... grams or ..... lbs.....ozs.; Were any operative or instrumental procedures used ?..... ; Specify ..... ; Indications ..... ; Did baby have any (1) congenital malformation ? ..... describe ..... (2) birth injury ? ..... describe ....."

It was expected that perhaps 40% or at most 60% of the certificates would be completed on the reverse. It has been found that actually more than 90% are completed. From the answers to the last question a tabulation has been made for the six months, Jan. 1 to June 30, 1940. In this period there were 44,986 certificates in upstate New York and answers to the above questions were given on 41,000 certificates. On 917 certificates birth injuries or congenital malformations were specified. An analysis of the descriptions by the department's orthopædic surgeons reduces to 286 the number of undoubted orthopædic conditions. A check of death certificates up to Oct. 1, 1940, shows that 75 of these babies (26·2%) had died by that date. The following table shows distribution of the orthopædic conditions:—

BIRTH INJURIES AND CONGENITAL MALFORMATIONS AMONG INFANTS BORN ALIVE IN NEW YORK STATE (EXCLUSIVE OF NEW YORK CITY) IN THE FIRST HALF OF THE YEAR 1940.

Total	917*
Orthopædic conditions	286
Spina bifida	71
Club foot	65
Harelip and/or cleft palate	44
Adactylism, polydactylism, syndactylism	37
Foot deformities, other than club	30
Deformed or undeveloped hand or arm	13
Erb's palsy	11
Congenital dislocation of ulna, knee, ankle	4
Hand, foot, or arm missing	3
Spastic	2
Torticollis	2
Atonic musculature, leg and arm	1
Bell's palsy	1
Osteogenesis imperfecta	1
Achondroplastic dwarf	1
Non-orthopædic conditions	631

* Exclusive of 11 residents of New York City or other states.

The department is under obligation not to make use of this information except for statistical purposes. However, 49 out of the 211 babies with orthopædic conditions have been separately brought to the attention of the orthopædic division of the State health department and in these cases the services of the department will be available for consultation.

WIRELESS INTERFERENCE BY DIATHERMY

It is exasperating to be listening to one of the numerous European stations and be interrupted by a storm of static put out by somebody's diathermy machine. Recently the Federal Communications Commission held an informal conference in Washington at which members of the medical profession and representatives of the manufacturers of electromedical equipment were brought together. One suggestion was that the manufacturers should construct their diathermy apparatus to operate on definite frequencies to be allocated for diathermy only. Three specific bands requested by the manufacturers

would have occupied 60 broadcast channels. The commission was unwilling to grant so much valuable air space and some of the manufacturers agreed that a restricted channel was possible but could be achieved only at prohibitive cost. Others did not believe it possible, since their equipment would be operated not by trained engineers but by physicians and their technicians. A committee appointed to look into engineering practices and circuit design costs will report to a future conference.

In England Now

A Running Commentary by Peripatetic Correspondents

WHEN one reads the strange patois of the patent-medicine advertisement, one is sometimes inclined to ask what picture such phrases as "acid stomach" or "chill on the kidneys" conjure up in the average person's mind. Probably everyone's is different, depending on their previous experience of acid and chill; the average young man will think of an acid stomach as a sort of wireless battery, while the modern girl will picture a chilled kidney as a large marron glacé. Often there will be no clear picture at all, for it is not the least of the functions of words to draw a curtain, sometimes a humorously distractive curtain, across tragic pictures—dotty, pegging out, mopping up, liquidate. I confess that when I read of, say, cholelithiasis or gastric ulcer I think of a far more diagrammatic gall-bladder than nature's own, of a far tidier stomach, not quite with traffic lights at the pylorus but getting on that way, so much so that when in the butcher's shop or P.M. room I see the real thing it always gives me rather a shock. Surely that wonderfully intricate structure, that marvellous mechanism, those Homeric contests could not have been staged in this unworthy piece of meat! Probably my diagrammatic thinking is due to my mind being incapable of consistently picturing the reality, that is to say I am doing for myself what the schoolmaster does for the boys on the blackboard, simplifying matters. Akin to this diagrammatic thinking is thinking in caricature, at which children and savages, and the child and savage within each of us, delight. To sum up the 120 million in the U.S.A. in the crisp figure of Uncle Sam, the Russian horde as a grasping and slightly immoral bear, although it may contain a wisp of truth, is a slovenly form of thought, or rather a way of saving oneself the trouble of thinking. Again I plead guilty. I always look on those grown members of our own family of nations as individuals: Canada, a businesslike young man, keen and practical; Australia, wiry, sporting and a little wild; New Zealand, deadly serious, a chip of the old block; South Africa, sunburnt, capable, with some psychological upset in his boyhood which has left a scar. This, of course, is of no importance in me, the village doctor, but when foreign offices think in the same way, as they have done for the last few hundred years, it is dangerous. These colossal nursery figures haunt the mind to the exclusion of reality. They give undue emphasis to the differences between nations and ignore the 95% of truth, the common humanity of us all. It is a childlike way of thinking, but then we are probably groping through the quite early childhood of man.

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I joined the other members of the fire-picket assembled in the assistants' room of the physiology department, and over tea and biscuits we talked of this and that for an hour or so. Two of the students had been discussing motives for murder, and they invited me to state my views, but I tried to steer the conversation into other channels. At 11.30 P.M. we decided to turn in, and taking a torch and a steel helmet I made my way to my post in the department of forensic medicine. The dark, empty corridors and the penetrating smell of cedar-wood oil produced a peculiar sensation of eeriness that I certainly did not experience earlier in the evening. The small coal-fire in the professor's room had burnt to a dull red glow and I poked it vigorously to a friendly flame. Having arranged my sleeping-bag and blankets on my camp-bed I began to undress. Outside the wind was rising and the draught made the doors and windows creak and rattle. I began to feel a curious reluctance to turn round or even to look about me; absurd, of course, but things do seem different when it's dark and one is alone in a large building. This little room and its adjacent laboratory, I mused, had been the scene of researches that had brought many murderers to the scaffold. Yes, there was Buck Ruxton; he must have suffered unspeakable anguish while awaiting trial. How many times did he rehearse his version of the mysterious disappearance of the two women? I looked up at the lab door, as if expecting an answer to come from that fateful room, but my attention was arrested by something that made my heart gallop and the sweat break out on my forehead. I spun round. The room was empty. I had been the victim of an optical illusion; the glass fronts of the bookcases were acting as parallel mirrors. The white face that I had seen staring at me was the reflection of my own. I coughed and walked over to poke the fire again to dispel the oppressive sense of loneliness. Then I quickly finished undressing and lay down on my bed. For a few minutes I tried to exclude from my mind everything but the instructions to firewatchers; if the professor's room were to catch fire, should I try to save his lecture notes? By invisible steps my thoughts found their way back to the Ruxton case, and soon the features of the two murdered women were dancing before my aching eyes. I whistled to drive off the evil spirits and soon I was gratified to realise that the whistling had ceased and my eyes were shut. I remember hearing the chimes of the university clock striking midnight; some of the strokes were loud, as though tossed into the room by the tempestuous wind that now howled around this attic storey, and some were smothered by the sound of rain that pattered viciously against the blackened skylight.

Was that somebody walking in the passage? I listened intently, but there was only the low moan of the wind and the flapping of a blind. No, I thought, there is no doubt about it now; a door had opened and it seemed to be the laboratory door. I gripped the sides of my bed and my heart bumped heavily and irregularly against my ribs. "Who's there?" I shouted, my voice scattering the silence like a broken glass. "Ha!" exclaimed the figure as he caught his foot against the leg of my bed, "this is new." Then he went on monotonously: "I'm here most nights about this time, but I've never had visitors before . . ." "Who the devil are you, and what do you want?" I shrieked at him. He made no reply for a time, but I could hear his rather heavy breathing. The glowing embers in the grate faintly illuminated the form of a smallish man dressed in a patchy white coat that smelt of the dissecting-room. He fidgeted nervously with his hands, and he seemed to have no control over his head which lolled about passively on his shoulders. When he moved he glided as though on wheels, and as I watched him he suddenly turned and transfixed me with protruding, glassy eyes. I lay hypnotised by that ghastly, mongolian face, and for a moment I felt like a terrified partridge awaiting the swoop of the hawk. "Now," he leered, "now, do you know me?" "Yes," I returned in a calm voice that astonished me even more than the frenzied tones in which I had first addressed him, "You are Ruxton." "Dr. Ruxton," he corrected me; "failed F.R.C.S. Edinburgh," he added with unmistakable pride. "Will you do me a favour?" he suddenly asked. "What is it?" I said guardedly. "I have the impression that my name has been erased from the medical register," he said feelingly, "will you find out for me?" "But didn't you expect that?" I queried. "After all, you were found guilty of . . ." "Murder," he said simply, apparently sensing my effort to spare his feelings. "But surely the G.M.C. has revised all that since the war started," he went on, seemingly puzzled and exasperated, "murder is commonplace now." "That's hardly right," I said in reply. "It's true that we're at war, but killing Germans and Italians isn't quite the same thing as murder, you know . . ." "Isn't it?" he asked, as though dissatisfied. "I only wish that it had happened in my time," he added in a whisper. "Why?" I inquired, somewhat surprised at the way in which he was developing the idea. "Well, you see," he replied, "ever since I was a child I have had a passion for destroying things—especially living things." I shifted uneasily in my bed. "I used to pull to pieces anything of the kind that I could lay hands on," he continued with obvious relish, "—insects, frogs, birds. The dissecting-room and practical surgery were the best parts of the medical course; I

always imagined that I was working with living subjects. But I never got a real chance to fulfil this urge; I wanted to be a surgeon." I smiled grimly in the darkness, but in a moment my smile vanished, for he resumed his monologue: "That's why I murdered those two, you know." "Quite so," I agreed quickly. "If only I had known that this war was coming," he went on, "that would not have been necessary; I should have found wonderful opportunities to kill people every day, and afterwards I should have come back to my practice." "But that's not murder, Ruxton, Dr. Ruxton," I remarked, "that's defending your country." "Ah, well," he sighed wistfully, "I should have revelled in it just the same. But do look me up in the medical register, I had to work so hard for those diplomas." "What does it matter, now that you are dead?" I asked, genuinely puzzled. "Dead, am I?" he asked with a sepulchral laugh, while his head lolled about as though it would drop off at any moment. "I'm not dead, I assure you. They think at the gaol that they killed me." Again he laughed, and I felt more and more impatient at his enjoyment. He continued: "I live in the thoughts of millions of people, yes, millions. That is what matters; and I don't suppose you can say the same thing." I made no comment on this statement, for I recalled that he was subject to maniacal outbursts of temper. "And in any case, except for my neck, I'm as good as any of you," he added defiantly. "Here," he said peremptorily, "just take hold of it and feel it." With this, the figure stooped down over my bed, and his cold wax-like features came close to my face. Nearer and nearer he came, and as the face approached it grew bigger and bigger until it filled the whole space of the room and I thought I should be suffocated or crushed to death. When my predicament had become almost intolerable I cried out in the darkness and my voice developed a curious warbling note. "Thank God!" I screamed as I flung myself out of my bed and ran to switch on the light, "that's the siren."

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We all know medicine has its fashions, and some of the more detached of us have long recognised that the fashion is largely dictated by the current of thought in the outside world. In war-time surgery and decisive medicine are in vogue; in the appeasing days of peace the pandering bottle of medicine, safety-first methods, interminable psycho-analysis, lethargic conservatism hold sway. In 1915 I went down with an acute attack of pulmonary tubercle. The time was fortunate and I fell into the hands of robustly-minded physicians. Mine was among the first pneumothoraces at a famous sanatorium. Those were the days of heroic refills, and several times over 2000 c.cm. sent my apex-beat to my right nipple and me gasping about my business. When I swam—and after the first few weeks I swam every morning before breakfast—I could not sink for the air within me. They got splendid results, those men of the hard exercise school, of whom the high priest was Marcus Paterson. Their theology of auto-intoxication may have been wrong, but their doctrine was eminently sound: fight the beast, don't appease him, seize every possible chance of getting in training short of provoking a febrile reaction, and keep it up; it is a whole-time contest, generally a life contest, and he who throws points away by late nights, over-smoking or drinking, slacking his exercise and getting soft, is going to lose. Later, as a doctor in various sanatoria, I saw the appeasers' treatment with its emphasis on rest, rest, rest. I saw the doctor going round the balconies taking care that patients were screened from the sun (they might get a reaction) or at a private sanatorium on the evening round like a wine steward—"What will you take to-night, an Allonal, a Sedormid, a Snoozoid, or just a little linctus?" Discipline was slack: "Let the poor fellows go to the races, let them go to the dance, it will take their minds off their disease." Bah to the appeasers!

My lung caused me no trouble for fourteen years, then it broke down and got a hole in its middle, necessitating a thoracoplasty. This wasn't nearly so unpleasant a proceeding as it sounds or looks, and I was working again in four months. It took me longer to recover the slight aggressiveness which is the visible result of continuously scrapping with an invisible foe. For the last eleven years my only trouble has been an occasional crop of pulmoliths which merely cause annoyance, choleric coughing and expletives. A curious point about them is that although they cause spasms of violent coughing they never come up then; an hour or so later one gives a little "chairman" cough and there's the brute in one's mouth, hard as nails, black-spotted, and up to the size of a hemp seed.

Now that we are getting well and truly into the war I expect they will be going back to the hard school in the treatment of tuberculosis. Its object is not so much to preserve life, which may not be worth having, as to return to normal life, which is.

* * *

What a vast number of cameos we collect going through life, whether squirrel-like for future use or jackdaw-like capriciously, I don't know. Here is one I turned out the other day from the beginning of the century: a hot summer's day, the prep. school sports, white dresses, small boys, hot and excited, glittering prizes; the headmaster, "Old Bug," turns to another incredibly old man of fifty or eighty or so, "Give me the long-distance runner every time. He has the enduring qualities and they are the ones that count in life." Perhaps I was reminded of this by the sight of Captain Plodder in bowler-hat coming home for a few days between trips across the Atlantic, which he has traversed Lord only knows how many times since war began; perhaps it was that sturdy band of A.R.P. workers. Their name is legion and they are the backbone, the large and small intestine, the heart and assorted viscera of the body, politic and belligerent. Not that sprinters don't have their uses, but theirs is a quicker tempo, more suited for acute crisis, and more evanescent. Mr. X came like a north wind amongst us, stiffening us to our tasks and bracing us to our duty. In this southern town we were, he reminded us, in the very forefront of the battle and none must leave the parapet. The matron must cancel the nurses' holidays and all of us stand-to. Nelson, we were told, only once went ashore and then but for a few hours in the eighteen months before Trafalgar. How right, we felt, he was, how splendid to emerge from his retirement and inspire us with something of the austerity of his native moorlands. But now we're not so sure, there is a certain staleness abroad. But perhaps that is because he's no longer there to spur us; he's gone with his family to the Midlands.

In the first week of the war I was going up the lane to my cottage, when strident hooting, crescendo, drove me into the ditch. In a swirl of dust a huge car sped by and I had a fleeting vision of Lady Pouncey in Red Cross uniform at the wheel. If ever there was a case of "The Guards need powder, and, by God, they'll have it too," here it was. Later I heard that the local ladies had commandeered the huge old rectory here as a hospital for sick evacuated children. They had got one small boy with tonsillitis and Lady P. was dashing up with extra blankets. Later I went to sea, but I learnt afterwards that although that was the only child patient they ever had there it was by no means their only experience of illness, for the ungrateful boy gave many of them his streptococcus, throwing in as a make-weight a few pediculi capitis, which those enthusiastic crusaders took home and distributed even to the third and fourth generation. Of course I know nothing about these good people's performance on the track, but I daresay there is something in what Old Bug said.

ON completing the seventy-fifth volume, the editor of the *Indian Medical Gazette* sends us a pleasant booklet on its history. The account appeared first in the December, 1940, issue of his journal and recalls notable men—among them Darwin, Cunningham, Ross and Rogers—who were early contributors. The gazette has been a steady record of advances in the study of tropical medicine, and more than once has shown foresight which later experience has justified. In its pages Macnamara suggested the use of emetine instead of ipecacuanha in dysentery; and in the same issue the possible value of the cinchona alkaloids other than quinine was forecast. It is discouraging to see still unfulfilled the hope, expressed in the first issue, that government laboratories should be set up, staffed by qualified chemists, to study the pharmaceutical products of India and make reliable preparations of them.

Public Health

Health of London County in 1939

Sir Frederick Menzies retired from the position of medical officer for London county and was succeeded by Dr. W. Allen Daley in November, 1939, and at the end of the year Dr. J. A. H. Brincker, whose work of recent years had been mainly in connexion with epidemiology, also retired. The annual report which in normal times consists of several large volumes is for the year 1939 contained in a pamphlet of 15 pages.

London was not the scene of battle in 1939, though it was expected to be, so the chief work of the county medical officer in the closing months of that year was to prepare for what did not happen until a twelvemonth later. The population of the county in mid-1939 was estimated to be 4,013,400, a decline of nearly 50,000 on that of the previous year; it has now been shrinking steadily for some time, mainly from dispersal into the Outer Ring. The county was not a self-contained unit when it was formed in 1888 and has long since had no boundaries except artificial lines, so its vital statistics are not those of the Metropolis. The death-rate in 1939 was 12·3 and the birth-rate 13·0. The former rises and the latter falls as the population shifts, apart from natural causes which produce variations of the rates. Infantile mortality was 47, a low level; this is interesting because the shift of population is not one which will favour a low infantile mortality, except for the reduction of overcrowding. Fatal street accidents increased from 363 in 1938 to 519 in 1939; deplorable and inexcusable as the holocaust is, it must be borne in mind that the tendency of those who work in London to reside outside the county increases the opportunities of street accidents within the county. As was the case throughout the country, there was no serious epidemic in London in 1939 and the numbers of diseases notified were exceptionally low. There has been no smallpox in London since 1934. The numbers of the less common epidemic diseases are interesting because, owing to the size of the unit, they give a just idea of the frequency of these infections in quiet times. Of cerebrospinal fever there were 169 cases with 34 deaths; of poliomyelitis and polio-encephalitis 98 cases with 16 deaths; of encephalitis lethargica 11 cases with 49 deaths. The last-named disease is dying out and those who suffered from it in the years of its prevalence (1920–25) are dying out also. Of food-poisoning, which has been notifiable in London for several years, there were 131 cases, less than half as many as in 1938. At the end of 1939 the county council was dealing with 11,708 mentally defectives; owing to the movement of population the council is saddled with a load of mentally defectives, chronically insane persons, and other permanently incapacitated citizens greatly in excess of its legitimate share. It is impossible to compare the health of London with that of the other great cities of the world and it would be unfair to gauge the health of the Metropolis from the records of what is just the kernel of a vast urban area. The City of London itself, which does not come under the county council, ceased to be a population unit years ago.

Chester Water

In a brief comment in this column (March 20, p. 429) on Dr. Lobban's report attention was called to wide variations from month to month in the chemical analysis of the river-derived water-supply, and the deduction was drawn that the water is subject to pollution. Mr. Frank Taylor, engineer to the Chester Waterworks Co., has written to say that these variations are not suggestive of poor quality, but are accounted for by last year's drought when, the river level being low, the flow was maintained by springs in the river-bed near the intake. If the high chloride had been due to pollution the figures for ammonias and oxygen absorbed would have been correspondingly raised. Absence of *B. coli* in 100 c.cm. placed the water throughout the year in class I category of the Ministry of Health standard. We are satisfied that Mr. Taylor's explanation is the correct one and regret the undue emphasis laid in our note on the variation in chlorides. Waters are now, of course, judged largely upon physical and bacteriological rather than upon chemical qualities.

From the Annual Reports

Owing to the abbreviation required by war conditions there is a sameness about the annual reports and an absence of the comments and obiter dicta which give them their chief interest. But brief as most of them are, they show that the health of the population varies considerably in different parts of the country, that the health services vary still more, and that the ways they are carried out vary most of all. But it is rarely possible to correlate the health of the inhabitants with the efficiency of the services which look after it, for preventive medicine is slow in effecting improvements which show. At infinity there may be a perfect method of dispensing health, but even if we could reach it it would have to be modified to suit local circumstances unless they also were perfect, and then no services would be needed at all.

If we take at random a number of reports of districts which are in no way exceptional, we find variations which are impossible to explain offhand, but by study over a number of years it is usually possible to discover their causes. Let us compare the 1939 reports of four boroughs: *Carlisle*, population 62,500, Dr. Allen Semple, M.O.H.; *Walthamstow*, population 130,000, Dr. A. T. W. Powell, M.O.H.; *Edmonton*, population 105,000, Dr. D. Regan, M.O.H.; *Grimsby*, population 92,230, Dr. J. M. Vine, M.O.H. The birth-rates varied from 18·2 in Carlisle to 12·3 in Walthamstow; the death-rates from 12·9 in Carlisle to 9 in Edmonton; the infant-mortality rates from 67 in Carlisle to 29·2 in Walthamstow. Infantile mortality is independent of the age-distribution of the population, but is not independent of the nature of the population. In theory it should be equal everywhere and in the present state of our knowledge and possibilities somewhere between 20 and 30. Why should some districts have infant-mortality rates twice, thrice, four times, and in some tropical parts twenty-five times the minimal rate? In this country towns with the highest rates have on the whole the most complete maternity and child-welfare services, but they are obviously not equal to the difficulties to be overcome. Infantile mortality is the best guide to the health amenities of a district, but it is no criterion of the efficiency of any specific function. The deaths from pulmonary tuberculosis per 100,000 population were: Carlisle 39, Edmonton 48, Grimsby 62, Walthamstow 63. The deaths from cancer similarly adjusted were: Carlisle 155, Edmonton 133, Grimsby 179, Walthamstow 161. The four towns together, with a total population of just under 400,000, had no deaths from the typhoids: there was 1 from measles in Grimsby; 1 from scarlet fever in Carlisle; 13 from whooping-cough; 16 from diphtheria. Diabetes caused 67 deaths.

The counties show as much variation as the boroughs, though the administrative counties are mainly rural or semirural and free from many of the special health deterrents of the towns. In three counties—*Cumberland*, Dr. Kenneth Fraser, M.O.H., population 199,000; *Staffordshire*, Dr. W. D. Carruthers, M.O.H., population 763,000; *East Sussex*, Dr. R. Ashlegh Glegg, M.O.H., population 319,000—the birth-rates were, respectively, 15·9, 17·4, and 11·8; death-rates 12·9, 11·2, and 13·1; infant-mortality rates 55·6, 58, and 34·7. The death-rates from pulmonary tuberculosis per 100,000 were: Cumberland 61, Staffordshire 48, East Sussex 37; the rates from cancer 165, 137, 200. Deaths from diabetes in the three counties with a total population of 1,280,000 numbered 220. Deaths from all endemic infectious diseases, excluding tuberculosis, syphilis and influenza, totalled 159. Public health is concerned with the healthy life and not with the death of citizens, but with few exceptions the toll of distress caused by various diseases can be measured by their mortality-rates. The exceptions to this are chronic rheumatism and psychological disturbances, neither of which has much direct fatality. Some infections, such as measles, whooping-cough, and scarlet fever, are of greater importance for their sequelæ than for their fatalities, but their mortalities are a rough guide to the incidence of their damage. We have always paid more attention to the acute infections than to the other causes of ill health in the belief that we could control the former but not the latter; modern researches tell us that our power over the infections is less than our

fathers believed, but that our power over "unpreventable" diseases is considerably greater. This should guide us in reconstruction of the medical services after the war, for preventive medicine is mainly in the province of general practitioners trained to regard life from its physiological rather than its pathological aspect. Epidemiological investigations must always be a communal business, but all else in preventive medicine is strictly personal.

Parliament

AS MR. HELY HUTCHINSON suggested Sir KINGSLEY WOOD'S realistic budget like Nebuchadnezzar's diet may be wholesome but it is not good. Yet the House of Commons accepted it with approval. Mr. F. W. PETHICK-LAWRENCE opening the debate said the only criteria of the proposals were: do they face up to the facts; will they deliver the goods; and are they fair? Dr. RUSSELL THOMAS, who delivered an eloquent maiden speech without notes, even asked for more. He thought us a peculiar people to allow our bodies to be conscripted for the forces yet hesitate when it came to our material affairs. And Mr. A. EDWARDS later said he thought Dr. Thomas was almost a symbol of the rapid transition which is taking place from orthodox capitalism to practical socialism. Captain H. F. CROOKSHANK was surprised that there was so little comment on the innovation of post-war credits, but Mr. P. C. LOFTUS regretted that children's allowances, which he regarded as an interlocking part of the Keynes plan, had found no place in the Chancellor's proposals, and several other members returned to this point. Mr. H. GRAHAM WHITE pointed out that we were illogical to have a wage system which pays no attention to family responsibilities and a social system which does, and Mr. D. L. LIPSON said that as a former Minister of Health Sir Kingsley must realise as few members could the need for this reform. On another point Mr. R. A. CARY reminded the House that when the war ends we shall not find peace; we have to build peace. The bogy of inflation stalked through the debate. But Mr. R. R. STOKES, who was doubtful whether we had yet paid for the battle of Waterloo, said he had heard it described as wind in the national belly.

Captain G. S. ELLISTON criticised the repeal of the medicine stamp duties on fiscal and public-health grounds. He pointed out that as recently as 1936 a Select Committee reported the duties should be brought up to date and simplified but were of the opinion that the trade was suitable for taxation. The public was warned against the bad results of the extravagant practice of self-medication, yet the Chancellor proposed to remove a tax which acted as a check on this habit. If these duties were wiped out a bill should be passed to control the advertisements of medicines. He understood that the patent-medicine vendors were prepared to accept such a measure, and Sir KINGSLEY WOOD promised Captain Elliston that he would take into account the suggestions he had made.

Mistake in the Budget Report

In the debate on the budget proposals Captain CROOKSHANK, financial secretary to the Treasury, drew attention to an error in the official report of the Chancellor's budget speech, the word "including" having been reported as "excluding." The passage should read:

"... the figures which I shall give to the committee are comparable with a total of Government expenditure under all heads, that is *including* for this purpose the value of any supplies that may be provided by Lease and Lend assistance and the amount of payments in the United States under existing orders. ..."

A Balanced Agriculture

In a debate on agricultural policy in the House of Commons, Mr. R. S. HUDSON, the Minister of Agriculture, said that in the last war our main effort was directed to increase the production of wheat and potatoes, while our production of milk and meat fell. In this war we must not only increase the production of wheat, potatoes and vegetables, but also keep up milk-supplies and grow more feeding stuffs for our cattle. We must avoid the mistake we made in the last war—and which the Germans made to a much bigger extent—of maintaining a large head of cattle on a bare ration which produced neither meat nor milk. It was better to keep a smaller head of cattle reasonably well-fed and producing milk and meat than to have them walking about doing nothing but grow old. If the farmers coöperate loyally, Mr. Hudson expects by the autumn to have in this country a herd of livestock which we can keep through the winter in good condition on home-grown feeding stuffs which will produce meat and milk. We shall also have large supplies of cereals and vegetables for human consumption. Our agriculture will thus remain flexible and well-balanced and capable of making a still bigger effort, as it will probably have to do, next year. In the dairy herds the poor yielders will be killed and Mr. Hudson hopes the reduction will have little effect on our total milk production.

QUESTION TIME

Medical Grading of Recruits

SIR ERNEST GRAHAM-LITTLE asked the Secretary of State for War whether he was aware that dissatisfaction existed regarding the methods at present in force by which the Army authorities overruled the grading of recruits by the civilian medical boards; whether he was aware that while two medical officers at least were required to reduce a recruit's category, one medical officer, unaided by any specialist or colleague, could raise that category; and if he would remedy this state of affairs.—Captain H. D. R. MARGESSON replied: The instructions for the medical classification of soldiers are at present in process of amendment. The effect of the amendments will be that the medical category of a recruit will not be altered during his first month's service unless the circumstances are exceptional. As regards reclassification after that period, apart from possible changes in a man's physical fitness during the time that may elapse between examination by a civil medical board and calling-up, disability may only come to light during training; on the other hand, the conditions of Army life may improve the physical fitness of a recruit to such an extent as to justify transfer to a higher medical category. Specialist advice is obtained by the Army medical officer where necessary.

Fees of Recruiting Medical Boards

Replying to a question the Minister of Labour said that the total sum paid in fees to members of recruiting medical boards in the 21 months up to Feb. 28, 1941, is about £1,199,000. The number of doctors at present on the panels of medical boards is 3,724.

Women Officers in the R.A.M.C.

Miss IRENE WARD asked the Secretary of State for War how many women hold commissioned rank in the Royal Army Medical Corps; and why female personnel for the Auxiliary Territorial Service are examined by R.A.M.C. doctors and male personnel by civilian doctors.—Mr. R. K. LAW replied: Eighty women hold commissioned rank in the Royal Army Medical Corps. The Ministry of Labour are responsible for the medical examination of men called up for the three Services under the National Service (Armed Forces) Acts as part of their general responsibility for the calling-up arrangements. As the Ministry of Labour are not responsible for the medical examination of recruits for the A.T.S., this examination is normally carried out by R.A.M.C. women doctors, but, if a R.A.M.C. doctor is not available, a woman civilian medical practitioner is employed. I see no objection to this arrangement which works well in practice and is calculated to secure the most economical use of medical personnel.

Aid for Doctors in Danger Zones

Mr. T. E. GROVES asked the Minister of Health what consideration had been given to the fact that doctors in danger zones had suffered serious financial losses and were experiencing great difficulty in making a livelihood and yet doctors in safe zones, by reason of evacuation, were profiting at the expense of those doctors who were trying to carry on in the danger zones; and whether some reasonable adjustment could be made, so as to compensate the less fortunate doctors.—Mr. E. BROWN replied: Measures to meet the situation described, which is not peculiar to the medical profession, are primarily a matter for the profession itself rather than for the Government. The Central Medical War Committee has acted as far as possible as a clearing-house for the transference

of doctors from evacuation to reception areas. The official arrangements for war-time medical services have also taken account of the special position of doctors in evacuation areas. For example, a number of those in coastal towns have been appointed to salaried posts in the Emergency Medical Service in their own towns or elsewhere, and the number selected for commissions in the medical branches of the Forces is proportionately larger in the evacuation areas than elsewhere.

Distribution of Medical Man-power

Sir FRANCIS FREMANTLE asked the Minister whether he had now established an organisation for settlement of priority, as between the demands of the several forces and departments, for medical men, recommended in January last by the Robinson Committee and urged by the Central Medical War Committee as essential to its work.—Mr. Brown replied: The Service Ministers and the Secretary of State for Scotland and I are awaiting the results of the measures which we have taken to carry out the other recommendations of the Robinson Committee, and in the meantime we have not thought it necessary to set up any special priority organisation.

Local Authorities' Finance

In answer to a question the Minister said that a total of £4,651,820 has been advanced to date to local authorities who are in financial difficulties owing to the war.

Vaccination

In answer to a question Mr. E. BROWN said that the numbers of death certificates received during 1940 where vaccinia or vaccination was mentioned or the death was attributed to vaccinia or vaccination, and the ages in each case, were as follows:

Deaths	Age	Deaths	Age
2	2 months	1	14 months
1	5 months	1	20 years
2	6 months	1	24 years
1	7 months	1	26 years

Mr. S. P. VIANT asked how many cases of post-vaccinal encephalitis came to the notice of the Ministry during 1939; and how many of them were amongst soldiers.—Mr. BROWN replied: Six such cases came to the notice of my department during 1939, of whom three were soldiers.

Superannuation of Nurses

Miss IRENE WARD asked the Minister of Pensions what was the reason for differentiation between men serving in the Forces and nurses serving in the Forces as regards assistance for meeting financial liabilities for the maintenance of superannuation benefits.—Sir W. WOMERSLEY replied: I am able, on the recommendation of the War Service Grants Advisory Committee, to make a grant in any case either of a man or of a woman member of the Forces where serious hardship arising from the fact of war service is shown. Any question as to contributions towards a particular scheme of civil superannuation applicable to all persons in a given class would not be a matter for my department.

N.H.I. Capitation Fees

Mr. GROVES asked the Minister of Health whether further consideration had been given to the question of increasing the capitation fee payable to insurance practitioners, or granting them a per capita war bonus, having regard to the increased cost of living and the increased practice expenses, as well as to the fact that the fee was fixed on an insurance basis which had entirely changed by reason of so many of the healthiest insured persons being withdrawn from civil life and serving with the armed forces.—Mr. E. BROWN replied: This question has received full consideration. I have come to the conclusion that under present conditions I should not be justified in proposing an increase in the capitation fee.

Phytic Acid in Wholemeal

Mr. T. LEVY asked the Parliamentary Secretary to the Ministry of Food whether he was aware that the phytic acid in wholemeal used up all the calcium contained in it; and whether he would therefore consider the addition of calcium to the Ministry's wholemeal loaf in order to protect consumers against rickets.—Major LLOYD GEORGE replied: Without accepting everything in the question I can assure you that this suggestion is under active consideration.

Letters to the Editor

ANY SUBSTITUTE FOR LIQUID PARAFFIN?

SIR,—A therapeutic problem has arisen which can, I am certain, be solved by the wealth of experience existing amongst your readers, to whom I appeal for advice. For many years we have learnt, and taught, that liquid paraffin is the best mild laxative available for those who constantly require something of this sort as well as for those who, owing to a temporary illness which confines them to bed, require a "maintenance dose" of some simple aperient. Liquid paraffin is now very difficult to obtain; what is the best substitute? An experienced practitioner to whom I appealed said that in the pre-paraffin days he used equal quantities of glycerin and cascara sagrada—not much help there today! But I am sure that many of the more senior physicians in general practice can give useful formulæ, and I trust that they will offer their advice at once, for the matter is somewhat urgent.

Harley Street, W.1. T. IZOD BENNETT.

THE NEUROLOGICAL APPROACH TO MENTAL DISORDER

SIR,—From the letters of your five correspondents of April 5 it appears that Group Captain Symonds's views on the treatment of psychiatric disorders, or that portion of it called psychotherapy, are not acceptable to two schools of medical psychology. The combination of "amateur and dangerous," "sterile," "reactionary," "brilliant and learned," and "nothing to offer" is formidable (and even confusing) if taken together as an adverse comment. Yet the lines * calling forth this comment seem eminently sound—"Competence in this, *as in other branches of treatment*, is to be achieved only by personal experience, and with the aid of personal experience and a few fundamental principles to guide him any man who has the qualities of a good doctor can *become* a sound psychotherapist." The italics are ours and we think important since by these expressions the author obviates any advocacy of indiscipline or slipshod training. The fact that he emphasises experience including "the broad foundations of clinical medicine with superstructure of neurology and psychiatry" is in keeping with the traditions of English medicine. This emphasis destroys the effect of the ambiguous adjective "unqualified" used by one of the writers.

Another correspondent has referred to the undocumented criticisms of the results of psychological treatment, thereby turning a blind eye to Curran's paper of 1937 referred to by Group Captain Symonds. Furthermore in his own reference to the *American Journal of Psychiatry* (1941) he has abstracted three points from the discussion of the American Psychiatric Association on present-day trends in neuropsychiatric research. This discussion, taken as a whole, places psychotherapy as employed by particular schools in its right perspective. The section to which reference is made (one of seven) is supported by two contributors, Dr. Harry Bakwin, *a pædiatrician*, and Dr. Paul Schilder. The latter observes "the teachings of the psycho-analytic schools are however necessarily one-sided. Didactic analysis carries with it the danger of proselitism and the perpetuation of individual idioscyncrasies." He does suggest a post-graduate training and teaching in psychotherapy with a definite curriculum of three or four years, but in large hospitals with medical schools. This conforms to Group Captain Symonds's opinion that "most important of all will be the conjunction of neurologist and psychiatrist at general hospitals to form departments of neuropsychiatry. In such departments there will always be room for those whose natural gifts and interests fit them especially for psychotherapy."

The conception that psychiatric treatment is limited wholly or in greater part to psychotherapy, as practised by the rules and technique of particular groups divorced from clinical medicine, cannot be generally accepted. Rather is it more pleasing to some to visualise the merging of medical, neurological, and psychiatric interests

* As they appear in the *Proc. R. Soc. Med.* 1941, **34**, 289.

as has been the tendency at the Maudsley Hospital. There, with a clinical background, treatments include psychotherapy based on fundamental principles, experience, and the qualities of a good doctor.

W. S. MACLAY.
Mill Hill, N.W.7. A. P. STOKES.

SIR,—I am honoured by the interest given by your correspondents to my address at the psychiatric section of the Royal Society of Medicine. I observe that of eight hostile critics five represent the Tavistock Clinic, one writes as director of the London Clinic of Psychoanalysis, one (Dr. William Brown) as director of the Institute of Experimental Psychology at Oxford, the other is a general physician.

Dr. Hunter's criticisms are instructive, for I suspect that they may be representative of the general physician of his generation who is perhaps out of touch with modern trends in psychiatry. Twenty years ago it was hopefully supposed that a new era had begun and that all mental disorder might soon be explained, and perhaps cured, in terms of psychopathology. It has taken psychiatrists many years to correct by experience the over-enthusiastic claims at first made on behalf of analytic psychotherapy. For a summary of the position as it appeared seven years ago I would refer Dr. Hunter to the presidential address to the psychiatric section of 1934 in which Dr. Mapother, estimating the scientific progress made by psychiatry in relation to what Dr. Hunter describes as "all the time and energy spent on psychological investigation in the last thirty years," concluded that the rate of such progress had been deplorably slow and that the retardation had been largely due to "distraction from painstaking, factual studies by the facile charms of animist speculation."

The position since then, as I see it, has improved in so far as the attention of psychiatrists today is directed more towards the facts of clinical observation in relation to heredity, constitution and metabolism, and less towards the hypothetical recesses of the unconscious mind. Confession of failure in one direction is not an expression of defeatism, but, as Dr. Hunter will surely admit, a stimulus to further effort. Witness the fact that mental disorder of a kind, which fifteen years ago was being subjected to psycho-analysis, is now being treated, and it would seem with more reason for hope, by means of convulsive therapy. What is indeed obstructive to scientific advance is a state of self-complacence. If it be true, for example, that affective disorder, whether of psychotic or neurotic degree, in most cases tends to recover in its own time, it is important that the advocates of any special form of treatment should subject their results to comparison with a control series. Dr. Curran's contribution to your columns (*Lancet*, 1937, **2**, 1005) provides a salutary lesson in this respect.

Dr. Hunter takes me to task for making no reference to the technique of examining the mind, but I would ask him to remember that I was addressing an audience for whom psychiatric examination is a matter of daily routine. I would add that, though the methods of psychiatric examination are time-absorbing, they contain no mystery. As to the fundamental principles underlying psychotherapy, I find these clearly expressed in the 1937 edition of Price's Textbook of Medicine. There is no need therefore for me to restate them. So much has been written about the technique of psychotherapy that there is surely no dearth of information for the student. I was not particularly concerned with this aspect of the subject in my address, except to indicate my view that the technique of psychotherapy is not so complicated or difficult as some would maintain.

Dr. Hunter's remarks about psychotherapy in the mild cases of affective disorder reveal his belief that the symptoms are produced by unconscious mental conflict. With this generalisation I cannot agree. I would not deny that conflict, of which the patient is not wholly conscious, may sometimes be an important factor, but I believe its importance and frequency have been greatly exaggerated with consequent under-estimation of other factors. "The technique for investigating conflicts below the level of consciousness," therefore, though important, is not so all-important as Dr. Hunter would infer. Incidentally, Dr. Hunter, when he argues that because I asserted that success in treatment depends much more upon the personality of the physician than the method employed I therefore suggested that there is no special technique of psychotherapy at all, distorts my meaning. He might as well say that the statement, that the success of an operation for cerebral tumour depended much more upon the skill and experience of the surgeon than the instruments he employed, implied that no special instruments were required.

Some of my critics have read into my remarks an intention to deny the value of psychotherapy altogether. One goes so far as to speak of my "open incitement to the practice of psychotherapy by unqualified persons." I would ask them to read my address again when it is printed in full. What I have said, or tried to say, is that there are in my view two kinds of psychotherapy. One is simple and straightforward and its essential principles are easily grasped. It should be considered as much a part of therapy as the use of drugs, exercises, or occupation, and is applicable in all branches of medicine, though most often used and furthest developed by the neurologist and psychiatrist. The other kind of psychotherapy is complicated, time consuming, expensive, and with difficulty understood by any but the devotee after three or four years' training. I have given it as my opinion that this kind of psychotherapy is of little value and in some types of mental disorder (to which it is nevertheless still applied) has proved harmful. As it is this kind of psychotherapy which is the stock-in-trade of the Tavistock Clinic and the London Clinic of Psychoanalysis, it is not surprising that their representatives have found this opinion provoking. There is possibly more cause of provocation than this, for I have suggested that there is no justification for psychotherapy as a special branch of medicine, that in the care of mental disorder treatment should not be divorced from diagnosis, and that diagnosis should be based upon an adequate training in general medicine, neurology and psychiatry. There are some medical psychologists who I think would admit that their qualifications in one or other of these respects fall short of the standards indicated in my address. That I am not so isolated from modern medical opinion as my critics would believe I am assured from private communications both from neurologists and psychiatrists.

I cannot take up your space to discuss criticisms in detail, but in answer to Dr. Bennet who asks what the neurologist can say of hallucinations, phantasy and dreams I must take the opportunity of referring him to the observations of Hughlings Jackson as an introduction to the neurological contributions to knowledge of these subjects.

I am neither so ignorant nor so unappreciative as Dr. William Brown suggests of the contributions of a strictly scientific and verifiable nature made by modern psychology to the advance of knowledge. Indeed I believe that it is essential for the neurologist as well as the psychiatrist to be educated in these subjects. This would be so if a diploma of neuropsychiatry, based upon the present diploma of psychological medicine, were made, as I have suggested, a qualification for hospital staff appointment no less for neurologist than psychiatrist.

With Sir John Parsons I am in full agreement. The object of my address was to show that there is a neurological approach to mental disorder, not to deny that there is a psychological approach. The latter is taken for granted. What I wished to emphasise was that no-one who is interested in the diagnosis and treatment of mental disorder can afford to neglect either approach and that at the present time neurologist and psychiatrist have each so much to learn from the other that they should enter into a closer alliance. Addressing an audience of psychiatrists, I stressed the importance of what might be learned from the neurological approach. Had I been addressing a gathering of neurologists the emphasis would have been on the other side. I am well aware that the neurologist in the past has neglected his opportunities and duty in the care of the neuroses. These opportunities are many, for judging from my own experience at least half the patients seen by a neurologist whether in hospital or private practice are suffering from "functional" rather than "organic" nervous disease.

If he is to remedy his defects the neurologist of the future must enlarge his education, being prepared to spend at least a year at a postgraduate school of psychiatry.

Henley-on-Thames. C. P. SYMONDS.

SIR,—Implicit in Group Captain Symonds's presidential address, and in the correspondence that has followed from supporters and critics, is the root question—Are there in fact any diseases at all of the mind *qua* mind? The late Sir Henry Head once told me that he doubted it, and I should surmise that Dr. Symonds is inclined to share that view. From this standpoint, all disorders of the mind are probably—as many have been demonstrated to be—disorders of the organ or instrument of the mind—namely, the brain and nervous system. From this standpoint, therefore, it is to the instrument, its structure and biochemistry, that the attention of research can most profitably be devoted. Changes of behaviour, speech, and presumably thought have, in so many cases, been traced to the damage done by invading organisms or their toxins, or to the over or under action of certain endocrine glands, that—from this standpoint—the balance of probability is weighted in favour of the belief that the as yet organically unaccounted-for neuroses, psychoneuroses, and insanities are similarly caused. From this standpoint, therefore, "pure" psychiatry and psychoanalytic observation and treatment can do no more than sometimes help handicapped sufferers to adjust themselves to their basic, organic, or instrument disabilities. They cannot *per se* remove those disabilities. All this, of course, is disputed by many, if not most, "pure" psychiatrists and psycho-analysts. But it would be a pity if the argument obscured Dr. Symonds's practical suggestions that neurology and psychology should be one specialty and that would-be neurologists should undergo at least a year's resident training in a teaching hospital for mental disorders and would-be psychiatrists at least a year's resident training in a teaching neurological hospital. This could surely do neither of them any harm, and I think it probable that most doctors would refer cases of what we at present call neurosis and psychoneurosis with far greater confidence to specialists thus trained.

London, E.C.1. H. H. BASHFORD.

MYOGLOBINURIA AND THE CRUSH SYNDROME

SIR,—There are close similarities between the recently described syndrome of anuria following crushing of limbs and equine paralytic myoglobinuria. I have examined the tissues in three cases of the crush syndrome and in all found hæmoglobin-like pigment—as granules, globules or confluent globules—in loops of Henle, second convoluted tubules, and collecting and discharging tubules of the kidneys. This was associated with oliguria or anuria and renal failure. Many muscles in the crushed limbs were strikingly pale; these and others often showed slight patchy hæmorrhage. Microscopically the muscle fibres showed reduction or absence of sarcolemma nuclei, but the internal structure of the fibres was not lost and the cross striations were often accentuated. The fibrillæ in many fibres were in places fragmented or disarranged. Some muscles showed slight acute inflammation or hæmorrhage.

Paralytic myoglobinuria occurs in horses very shortly after they have been taken out to work, following a rest period of a few days on a full working diet, especially one rich in carbohydrates. The horse becomes lame in one or more limbs, and the muscles therein become firm and the urine is coloured by myoglobin. Death may result in a few days and at necropsy certain muscles are very pale, like fish muscles. The kidneys contain casts of the pigment and the muscles show degeneration and necrosis of the fibres. Carlström (according to F. C. Minett, *Proc. R. Soc. Med.* 1935, **28**, 672) found in horses that during a period of rest on a high carbohydrate diet much glycogen is stored in certain muscles. When these muscles suddenly became active an excessive amount of lactic acid was produced which led to damage to the muscles. However, he showed that circulatory impediment was a necessary second factor, since an excess of lactic acid alone, as occurs in fatigued muscles, would not produce the changes.

In the crush syndrome the second factor, circulatory impediment, is present and is accentuated in many cases by marked local œdema. The first factor, an excess of lactic acid and glycogen, may also be present. The subjects are well nourished, and the muscles affected have had a period of enforced rest during which time storage of glycogen might occur. On removal to hospital the muscles will again become active, and an excess of lactic acid might be formed which would not be removed or oxidised owing to the circulatory impediment. It is while in hospital that symptoms usually first appear. Camus and Pagniez (according to Minett) showed that myoglobin has a lower renal threshold than hæmoglobin, and on injection of muscle juice into animals the myoglobin appears in the urine without being visible in the blood. This would explain the absence of pigment in the plasma in the crush syndrome.

The pigment in the renal tubules in one of my cases will be examined spectroscopically for myoglobin, but I take this opportunity of suggesting a myoglobinuria theory for the crush syndrome so that the urine in early cases may be examined by others for the pigment.

St. Andrew's Hospital, Billericay. J. R. GILMOUR.

INFECTED DUST

SIR,—With regard to the rôle played by dust in cross-infection and reinfection in hospital wards, some observations may be recorded which throw doubt on the efficacy of the formalin spray and ward-cleaning, as carried out in many of our hospitals, in destroying hæmolytic streptococci in dust. The observations were made in a single-bed ward 12½ ft. long, 9 ft. wide and 13 ft. high. It was situated near the general staircase with its door opening on a wide passage between two large wards. It was used as an isolation ward by the maternity department, which had been compelled by war conditions to vacate its normal premises.

On Feb. 21 a patient, Mrs. R., was admitted to the ward on the fifth day of her puerperium. She had had a sharp rise of temperature to 103·6° F. on the previous day. Numerous hæmolytic streptococci of Griffith's type 4 were present in her vagina but there were none in the throat; she stayed in the isolation ward for 24 hours. After her departure the ward was sprayed with 40% (i.e., undiluted commercial) formalin, a fine spray being directed towards the floor and one foot up on the walls. The ward has a good composition floor without obvious cracks and walls covered with oil paint. The process of spraying took 5–10 min. and about a pint of formalin was used in all. During the spraying the windows and door were tightly shut, and the ordinary furniture of the ward and the blackout curtains were left in position; the bedding had, of course, been removed for disinfection. After the spraying the ward remained closed for 24 hours, to allow the formalin vapour to take effect. The cleaners were then allowed in and the walls and floor were washed with soap and water. The height to which the mop reached on the walls was limited by the altitude attained by the cleaner without the assistance of a chair or ladder.

On Feb. 25 another maternity patient who had just been delivered was moved into the ward. Her puerperium was uneventful, but numerous hæmolytic streptococci of Lancefield group C were found in her vagina and a few in her throat. This patient, Mrs. T., stayed in the isolation ward for 3 days; she left on the evening of Feb. 28.

Blood-agar plates were exposed in the ward between 6 and 11 A.M. and between 3 and 6 P.M. on Feb. 28, and between 6 and 11 A.M. on March 1. Two plates were used each time, one being placed on a chair 3 ft. from the bed and the other on the mantelpiece by the wall opposite the bed. The ward was swept and the bed made during the exposure of the morning plates, both on Feb. 28 and March 1, although the patient had left on the evening of Feb. 28. All plates produced a heavy growth of various organisms, among which 1–3 colonies of hæmolytic streptococci were found in each case. Of these, 9 were grouped, 3 falling into Lancefield group A and 6 into group C. One of the group-A strains was typed and was found to belong to Griffith's type 4. Dust from the ward was collected on March 1 and treated in the following way. A screw-capped container

3 in. by 1 in. was two-thirds filled with dust; about 15 c.cm. of broth was poured into it and the mixture was vigorously shaken. A loopful of the washings was then plated on each of four blood-agar plates. Of these three produced 1–3 colonies of hæmolytic streptococci each. In all, 4 colonies were grouped, 3 falling into Lancefield group A and 1 into group C. Of the former, 2 were typed and shown to belong to Griffith's type 4.

It can be seen from this account that type-4 hæmolytic streptococci were found in the air and dust of a single-bed ward several days after the patient carrying them had gone and the ward had been sprayed with formalin and washed. The reason for the presence of group-C streptococci is, of course, obvious. The nursing staff and ward maids were being swabbed between Feb. 19 and 24, and so far as could be ascertained no-one carrying type-4 hæmolytic streptococcus entered the ward after its disinfection. It is most probable that the type-streptococci were implanted there by the patient R and perhaps also by members of the nursing staff before disinfection was carried out. E. White (*Lancet*, 1936, 1, 941) has found undiluted formalin very satisfactory in disinfecting streptococcal wards and this suggests that formalisation was more thorough in her experiments, or perhaps that our isolation ward contained some nooks and crannies offering particularly good protection to the cocci. One reservoir of infection might have been the dust which had collected high up on the windows and on the ceiling and blackout curtains. Unfortunately this dust was not cultured, but elsewhere in the hospital hæmolytic streptococci have been found in dust deposited 9½ ft. high on a ledge from which the blackout curtains were suspended.

London. V. GLASS.

NARCOLEPSY

SIR,—Dr. Wilson Gill's paper is of interest in recording three further cases of traumatic narcolepsy. But in discussing the ætiology of idiopathic narcolepsy—i.e., narcolepsy of unknown origin—he seems to me to go far beyond the ascertained facts in suggesting that "narcoleptic symptoms are often the result of a localised mild encephalitis due to an attenuated form of the virus." That the complete syndrome of narcolepsy plus catalepsy occasionally follows an acute attack of epidemic encephalitis there is no doubt, but Dr. Gill produces no evidence whatever that the relatively much more numerous cases of "idiopathic" narcolepsy have anything to do with encephalitis. Their ætiology is completely unknown, though by analogy with other types of sleep disturbance it is reasonable to assume that the hypothalamic region is involved in some way. It is unwise to jump to any other conclusion.

One other point of his paper calls for comment—the condition of the reflexes during cataplectic attacks. Many patients have now been examined in the attack; I have had such an opportunity myself on several occasions. It is established that during the attack the deep reflexes are completely abolished, returning to normal immediately the attack ends, but there is no confirmation of Kinnier Wilson's observation of an extensor plantar response during the attack. W. J. Adie, writing to me in 1931, said, with perhaps rather characteristic dogmatism, "no-one has ever seen an extensor response: it is almost certainly a false observation." This is of some importance in relation to the mechanism of the attack, for it means that there is no indication of any involvement of the upper motor neurones.

Of the alleged increased incidence of narcolepsy in recent years I have myself seen no evidence.

Newcastle-on-Tyne. F. J. NATTRASS.

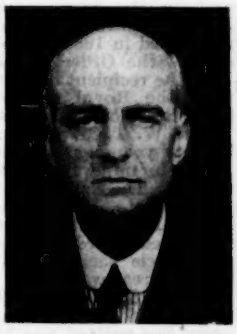
CROOKES LABORATORIES are issuing a synthetic lemon powder. They claim that 1 level teaspoonful of the powder in 2 tablespoonfuls of water gives approximately 10 units of vitamin C (ascorbic acid) and 80 mg. of citric acid per ml. Crookes Lemon Powder is for use in the treatment of vitamin-C deficiency, but it can also be taken as a refreshing drink. A bottle, costing 2*s.* 10*d.*, is said to be equivalent to nearly 30 tablespoonfuls of lemon juice.

Obituary

ARTHUR STANLEY GRIFFITH

O.B.E., M.D. LPOOL,, PH.D. CAMB., D.P.H.

Dr. Stanley Griffith died in his sleep on April 9 at his home in Cambridge. He had just entered his 67th year and completed his first year of retirement from the service of the Medical Research Council. A graduate of the Victoria University, of which the Liverpool medical school was then a part, he qualified in 1897 and took his doctorate in medicine in 1901. He early showed his aptitude for the research in bacteriology to which he was to devote the rest of his life, his first work being at the Thompson-Yates laboratory from 1899 to 1902. When the Royal Commission on Tuberculosis started its experimental investigations in 1903, Rubert Boyce, as one of the commissioners, brought Griffith to join Louis Cobbett at Stansted, and there, on one of the commission's farms, he spent seven happy and fruitful years. The story of his ingenious and fertile labours is written in the commission's reports, volumes known throughout the scientific world as models of exact and careful statement, still standing unchallenged as to fact and convincing as to conclusions. The unwonted rashness with which Robert Koch proclaimed that bovine tuberculosis was harmless to man met its deserved penalty in Griffith's observations and the question has long ceased to be matter of controversy.



But the *Mycobacterium tuberculosis* and its congeners among the acid-fast bacteria had still many secrets to yield and, when the Royal Commission dissolved in 1910, its purpose fulfilled, Griffith was induced by Sims Woodhead to transfer his laboratory to Cambridge as the nucleus of the field laboratories of that university. The transfer was a literal one, for the actual wooden sheds that had stood the weather already for seven years were re-erected on the site at Milton Road and have remained there ever since, the unassuming place of pilgrimage for tuberculosis workers the world over. Though the shack of the pioneer was soon overshadowed by the handsome buildings of the Institute of Animal Pathology, Griffith remained content with its modest sufficiency to the end. From 1911 to 1914 as Grocer's research scholar he continued the painstaking study of the natural history of the tubercle bacillus. In 1914 he entered the service of the Medical Research Council as a whole-time research worker and in this service he spent the rest of his working life.

And a life work was necessary, for in no field of nature study, not even in plant and animal genetics, is patience more required than in the study of tuberculosis. Any experiment, whether on the cultural behaviour of the tubercle bacillus itself or on its effects on the animal body, may take months or years to give its answer. No short cuts are possible; the next step must ever wait with its foot long suspended, and knowledge grows like the growth of the stalagmite from long-spaced droplets through the years. The ingenious planning and the careful and continuous observation that are requisite can well be admired by bacteriologists accustomed to the rapid generations of other pathogens. Of the many technical inventions of which he was the author, the "Griffith tube" for tissue emulsification will alone perpetuate his name.

This is not the place for the full bibliography of Griffith's published papers, some 72 in number. They deal with tuberculosis as it occurs throughout the animal kingdom, with the effects of artificial immunisation on resistance to tuberculous infection, and with the sources from which human tuberculosis is acquired. A completed study of the bacteriology of lupus is in manuscript for publication in more settled times. The preparation of therapeutic serum for meningococcal infection and of

anti-leptospiral serum for Weil's disease were occupations interpolated during the war years of 1914–18; both were of immediate and very great value.

Though for many years Griffith was the judge of appeal in any disputed point in the biology or specific identity of acid-fast bacteria, he was scrupulous almost to a fault in giving credit to the less-experienced worker whose results were submitted for his confirmation. And nothing vexed him more than the inevitable tendency for others to ascribe to him as originator new knowledge which he had "merely" had to test before it could be generally accepted. His distinguished services to science and on the joint committee on tuberculosis of the Medical and Agricultural Research Councils were recognised in 1939 by his appointment to a companionship of the Order of the British Empire. He was in 1927 the recipient of the Weber-Parkes prize and medal from the Royal College of Physicians. Dr. Griffith leaves a widow and one son, still at school.

And W. T. M. writes: Griffith was no lone worker. Twenty years ago I approached him detailing a scheme I had in mind for investigation in pulmonary tuberculosis. The reply was one of advice, help and an offer to coöperate. Thus began an association which was to lead to many joint investigations. With what pleasure we visited Aberdeen and arranged a study of the types of tubercle bacilli found in pulmonary tuberculosis in a rural area, work since reported in collaboration with Dr. John Smith. Griffith had an international reputation; its foundation was that his work was accurate, every line written was based on observation, not what he hoped to find but what he saw. His friendly contacts were numerous—in Paris, in Berlin, in Vienna, in Copenhagen—but we, north of the Tweed, who worked with him, counted ourselves as personal friends. Griffith's work will live: it means the saving of untold lives.

WILLIAM JOSIAH SMYLY

Kt., M.D. DUBL., F.R.C.P. & S.I., F.R.C.O.G.

Sir William Smyly, who died at his home at Monkstown, co. Dublin, on March 19, had completed his 90th year in November last. He was born in Dublin, the third son of Josiah Smyly, F.R.C.S., his elder brother Philip later becoming P.R.C.S.I. William was educated at Trinity College, where he graduated with honours in natural science and took his degrees in medicine and surgery in 1872. Having studied in Vienna, he was appointed assistant master at the Rotunda Hospital in 1877, where he held office for three years under the mastership of Lombe Atthill. In 1882 he was appointed gynæcologist to the City of Dublin Hospital and two years later he was elected a fellow of the Royal College of Physicians of Ireland; since the death of Sir John Moore in 1937 he was senior fellow. In 1889 Smyly returned to the Rotunda as master, in succession to Arthur Vernon Macan, and it was the energy and capability of these two masters that brought the Rotunda into line with the requirements of modern surgery. The hospital had been passing through stormy times, and its high mortality from puerperal sepsis had led to a proposal that it should be closed, but Macan initiated many improvements which Smyly carried through in detail. He reorganised the nursing service and insisted on the appointment of a lady superintendent. He removed the confinements from lying-in wards to separate labour wards, which were occupied in regular rotation thereby allowing for frequent cleaning and disinfection. It was during his mastership and largely owing to his personal exertions that a new wing for gynæcological cases was added to the hospital, including accommodation for the nursing staff. This wing also included a new surgical theatre, the first modern aseptic theatre built in Ireland. After leaving the Rotunda in 1896 Smyly was appointed gynæcologist to the Adelaide Hospital, on the staff of which he remained until 1920. A few years ago he retired from active practice, but he kept up his interest in the several medical institutions with which he had been connected, particularly the Rotunda and the Royal Academy of Medicine.

As an obstetrician and gynæcologist Smyly cannot be said to have originated any method or procedure of outstanding importance but, as a friend has written of him, a marked sign of greatness was his readiness to adopt and develop the good that others had initiated. Until old age he kept up his interest in modern advances and in discussions at the Academy of Medicine and elsewhere, revealing a progressive and open mind. When no longer occupied with hospital work he could be found many mornings in the week studying the fresh journals in the college reading-room. Although he wrote no book himself he was the inspiration of more than one by his pupils, and he contributed many standard articles to special journals. A winning feature of his character was the encouragement he gave and the kindness he showed to younger colleagues. He was willing to help, but he was also ready to learn. As a consultant his gentle manner and quiet confidence gave encouragement to the most nervous patient and his judgment seemed to be never at fault.

Smyly married in 1881 Eleanor Colpoys, daughter of Dr. Henry Tweedy, who died in 1938. Their only son is associate professor of medicine in the University of Shantung.

GEORGE ROBERTSON TURNER

K.B.E., C.B., F.R.C.S.

Sir George Turner, consulting surgeon to St. George's, who died at his home at Hove on April 7 at the age of 85, was brought up in the shadow of the hospital, for his father, George Turner, M.R.C.S., practised medicine near Hyde Park Corner. Turner was educated at Uppingham in the time of Thring, but it was of his days as a student at St. George's that he had the happiest recollections. There his interest in his work whetted his industry and he carried off many prizes and scholarships. But he still found time to continue his running, and in 1876 he was one of the English rugby team to play against Scotland. He qualified M.R.C.S. with distinction in 1878 and received a house-appointment at St. George's. When only twenty-five he topped the list of successful candidates for the F.R.C.S., and six months later, already heir-apparent to the visiting staff at George's, he was elected to the staff of the Dreadnought Hospital for Seamen at Greenwich. He worked there for 18 years, only retiring when he became a full surgeon at St. George's. He was a capable orthodox surgeon of high personal standards and robust straightforward views. Though he might on occasion, to the secret delight of his fellow members, explode at a committee meeting, he was an upright and cheerful friend and his colleagues found him good to work with. When war broke out in 1914 he was already a major in the R.A.M.C. (T.A.), but his work at Greenwich could not be overlooked and he was appointed a consultant to the Admiralty with the rank of surgeon rear-admiral. For his work at the naval hospitals at Chatham and Plymouth, he was later appointed K.B.E. and C.B.

A. P. Steer, Plymouth

At St. George's Turner had lectured in anatomy and later in surgery, and he had examined for the conjoint board in anatomy. He published an important lecture on appendicitis and he also wrote on the radical cure of hernia and contributed articles to Heath's Dictionary of Surgery, and Latham and English's System of Treatment. In his retirement he found time and pleasure in less formal writings. His Unorthodox Reminiscences, which appeared in 1931, were the running commentary of a man of the world on a life which was medically and socially cosmopolitan, and he drew many anecdotes from his favourite sports of racing and motoring. In 1933 his Mary Stuart—Forgotten Forgeries was published, and only a few weeks ago he was once again championing Mary's cause in a letter to our columns.

Sir George married Isabel Da Croz, who died in 1926. They had two sons, one of whom was killed in the last war, and three daughters.

RUBY THOMSON

M.B. EDIN., D.P.H.

Dr. Ruby Thomson, who died at her home in West Kensington on April 3 in her fifty-first year, was the daughter of Dr. John Christopher Thomson, sometime Government medical officer in Hong Kong. She graduated in medicine at Edinburgh in 1912, and after holding some house appointments was appointed in 1914 senior medical officer to the Staffs county council, acting as chief tuberculosis officer 1915–18, interrupted by a period as R.M.O. at Woolwich Arsenal. A year as assistant M.O. for maternity and child welfare in Willesden led to her call to Fulham, where she took a full share in the inauguration of the council's first maternity home, infant welfare clinics, day nursery and babies' hospital. For many years she represented the local authority on the National Baby Week Council and on the Association of Maternity and Child Welfare Centres, until in June 1940 failing health obliged her to retire. Her loss will be widely felt, for her honesty of purpose and enthusiastic interest in every phase of maternal and child welfare endeared her to colleagues and patients.

Medical News

Society of Apothecaries of London

The following candidates, having completed the final examination, are granted the diploma of the society entitling them to practise medicine, surgery and midwifery: E. Crews, Guy's Hosp.; M. M. El Garrahy, St. Mungo's Coll., Glasgow; and S. Wetherell, Guy's Hosp.

At the Royal Society of Medicine at 4.30 P.M. on Tuesday, April 22, the section of medicine will meet to discuss the nature and treatment of the effort syndrome. The openers are Dr. H. J. Starling, Dr. Paul Wood, Dr. Aubrey Lewis and Dr. Maxwell Jones. At 5 P.M. on the same day there will be a general meeting of fellows of the society. On April 22, at 4.15 P.M., at the section of comparative medicine Mr. Frederick Blakemore, D.V.S.M., will open a discussion on swine influenza in the British Isles, and Miss M. G. Macfarlane, Ph.D., and Mr. B. C. J. G. Knight, D.Sc., are to read a paper on enzymic activities of *Cl. welchii* toxins. On April 26 the section of orthopædics will meet at the Wingfield-Morris Orthopædic Hospital, Oxford. Dr. A. H. Robb-Smith and Mr. J. C. Scott will read a paper on fat embolism, and Mr. W. B. Foley will report on cases of septic arthritis. In the afternoon at 2 P.M., Dr. J. M. Barnes and Mr. J. C. Scott will speak on the spread of bacteria and toxins from infected wounds. On the same day at 2.30 P.M. at the section of physical medicine Dr. P. Bauwens will open a discussion on the value of electrodiagnosis and electrotherapy in peripheral nerve lesions. This meeting will be held at Botleys Park War Hospital, Chertsey, Surrey.

An ordinary meeting of the Medico-Legal Society will be held at 26, Portland Place, London, W.1, on Thursday, April 24, at 5 P.M., when Dr. J. C. M. Matheson will read a paper on infanticide.

A meeting of the subscribers of the Naval Medical Compassionate Fund will be held at 3.15 P.M. on April 30 at the medical department of the Navy, 64, St. James's Street, London, S.W.1, to elect six directors of the fund.

Colonel (temporary Brigadier) C. M. Finny, F.R.C.S., late R.A.M.C., has been appointed an honorary surgeon to the King in succession to Colonel Benjamin Biggar, and Major-General O. W. McSheehy, M.B., late R.A.M.C., in succession to Major-General F. D. G. Howell. Major-General J. A. Manifold, M.B., late R.A.M.C., has been appointed an honorary physician to the King in succession to Major-General J. W. L. Scott.

The Eireann Minister of Defence has appointed nine physicians and surgeons headed by Commandant P. J. Delaney to come to London to study civil defence arrangements. The mission will investigate medical problems arising out of evacuation and visit some of the reception areas. They will study the steps which are being taken to guard against the spread of infectious disease, and also examine the arrangements for maternity homes, first-aid posts, ambulance services, base hospitals, medical supplies and blood transfusion. The Ministry of Health is providing full facilities for the mission's tour of inspection.

Notes, Comments and Abstracts

A PHARMACIST LOOKS FORWARD

IN his address to the members of the British Pharmaceutical Conference on April 16 Mr. A. R. Melhuish, the chairman, speaking, he said, as "a workaday practising pharmacist," impressed on his colleagues the importance of personality. The pharmacist, he thought, can only develop that if he trains himself so that he can express with confidence opinions worthy of attention; he will be doing service to the community if he can say with knowledge "This is rubbish," or "That is a grossly exaggerated claim," or "This is exactly the same as a preparation in the pharmacopœia." The line of development of public-health services can be seen clearly enough: the National Health Insurance Act, with medical, dental and ophthalmic benefits, will be extended as funds permit to more and more of the population. Locally, medical services of local authorities will supplement the N.H.I. service on a basis of regional hospitals. There will be an absorption of the insurance committees into the local authorities' machinery, as recommended by the Rolleston Commission; just as there will be a marriage between the voluntary and the municipal hospitals. In this development there will be an increasing growth of the pharmaceutical services of authorities and an increasing use of the N.H.I. system of supplying medicines. While a widespread network of pharmacies exists, as it does today, bringing a dispensing service to everyone's door, pharmacists need not fear the spread of state dispensaries. But they should cease to strive for such politically unattainable goals as reservation to the craft of the right to sell all medicines; they will be doing far more for themselves and for the medical services of the country if they devote their energies to the fields of activity which do not involve legislation.

THE RIGHT TO FITNESS

SOME say—G. K. Chesterton was one—that we are not entitled to expect anything of life, and that it is a great piece of luck for us that we are alive at all and enjoying as many things as we do. Others feel that man with his forebrain and his great opportunity has made a grievous mess of his world. Of these two attitudes—the optimistic and the pessimistic, perhaps—it is, oddly enough, the pessimistic which is the more constructive, at any rate in the field of public health. Dr. Aleck Bourne, speaking at the Students' Congress at Cambridge, the early part of which was noticed in our issue of April 12, spoke of good health as a right of the citizen, comparable to the right of being policed and defended. The state, he said, recognises the need for universal education but does not yet admit this public right to health, inasmuch as many known causes of ill health are still tolerated. He quoted the Rhondda Valley experiment as a case in point. Vitamin therapy, in that area, halved the maternal mortality-rate, which had previously been nearly thrice the average rate for Britain. Much of our national ill health is due to such factors as malnutrition, overcrowding, long working hours, ignorance and poverty. If all curative medicine ceased and all research was held up for two years during which people were fed adequately and housed decently he believed that at the end of it the race would be healthier. In his view, national ill health will not be solved by better doctoring but by eradicating causal conditions; when that is done we shall have a chance of building people resistant to physical attack by infection and mental attack by stress.

HOSPITAL READING

BEFORE reading became a universal accomplishment many people must have dreaded a sick bed less for the pangs of disease than of boredom. The Guild of Hospital Librarians find[1] that only a few hospital patients refuse books on the grounds that they "never read, thank you"; most of them make good use of the hospital library. Their choice of books is interesting; at hospitals for sailors there is great enthusiasm for "Westerns," and the puzzled librarian wonders whether a corresponding number of cowboys yearn for a good sea

1. *Book Trolley*, April, 1941.

yarn. Edgar Wallace is a favourite author, though some complain that thrillers fall short of their personal experience. Philosophy, essays, religion and feminine memoirs are a drug on the market. In addition to taking round the book trolley librarians collect and distribute illustrated papers and magazines, provide books in foreign tongues for our allies, hoard up discarded books for infectious cases, bind afresh those which are worn by use, keep sheet music for convalescents who want to play the piano, provide paper and string for parcels, register letters and undertake shopping commissions. After Dunkirk they had their hands full writing letters for the wounded, telephoning and telegraphing their relations and even visiting those who lived close at hand.

The last eighteen months have produced other problems. Librarians found that emergency hospitals, especially those of the hut type, were often unable to provide a room to hold books; there were no ladies' committees and no funds; and timber was short, so that cupboards and shelves were luxuries. They had to become inventive. Some have stacked books in packing cases and card indexes in boot boxes, and others have found sanctuary for their volumes in apple-racks, boot-racks and wardrobes. Where shelves can be had wire netting doors can be padlocked over them. Air-raid casualties have also given scope to their ingenuity; patients with burned hands cannot hold a book and book rests must be improvised. The Red Cross have provided some from their stores, and a girls' technical school is making a further supply. The guild have good friends in the book trade; the Westminster depot which works at collecting and distributing books and magazines has the loan of free premises from one publisher, free glue and cloth from others, boards and paper from others, and publicity and advice from the National Book Council.

NEW FORM OF CHADWICK LECTURE

LAST autumn when the sequence of public lectures arranged by the Chadwick trustees was interrupted by war conditions the trustees offered prizes of £100 and £50 for the two best essays on the construction and management of air-raid shelters. The first prize was awarded jointly to Dr. S. L. Wright and Mr. Philip O. Reece of Wembley, who were then invited to lecture at the London School of Hygiene on April 8. Dr. Wright discussed the dangers of epidemic disease associated with dormitory shelters for large numbers of persons by reason of droplet infection and infected dust. He advocated glass cellular cubicles if feasible, spraying the air with hypochlorite, the use of muslin or Cellophane respirators, and adequate lighting to dispel gloom, the maintenance of mental and physical fitness being important to fortify resistance to infection. Mr. Reece exhibited plans of shelters for 500 people in sections radiating from a central tea-room; he preferred deep to surface shelters and drew attention to the analogy between earth tremor from bombs and from earthquakes. He advocated reinforced concrete for the construction of surface shelters, which should prove useful after the war for social centres or isolation hospitals. Sir William Collins who presided said that the public with their herd instinct appeared to have been wiser than some politicians in preferring deep shelters and tubes to Anderson shelters and so-called mouse-traps, while those who foretold serious outbreaks of epidemic disease in communal centres had been discomfited. Chadwick's "sanitary idea" was, he felt, apposite to the new problems raised by air-raid shelters.

SUBCUTANEOUS IMPLANTATION OF THYROXINE

DURING the last two years experiments with several hormones have shown that subcutaneous implantation of the solid material is followed by a gradual absorption of the active principle at a much slower rate than with other methods of administration so that the effect is prolonged for days or weeks instead of lasting for a few hours. Addressing the British Pharmaceutical Conference Mr. Frank Wokes, Ph.D. (College of the Pharmaceutical Society) described the results of experiments with thyroxine in male guineapigs. His observations lead him to conclude that great caution should be employed in the implantation of thyroxine tablets in human subjects and that the oral administration of thyroid appears to be much safer and more effective.

Appointments

BREWER, H. L., M.B. Melb., F.R.C.S., R.S.O. at the Corbett Hospital, Stourbridge.

Colonial Service.—The following appointments are announced:—
APTED, F. I. C., M.B. Lond., D.T.M. & H.: M.O., Sierra Leone;
CHELLAPAH, S. F., M.R.C.S., D.P.H., D.T.M. & H.: D.M.S.S., Ceylon.
COCHEMÉ, M. A. X., M.B. Camb., D.T.M. & H.: M.O., Malaya;
HARTHAN, G. D., M.B. Manc., D.T.M. & H.: M.O., Nigeria;
HAWE, A. J., M.D. Lpool, M.R.C.P., D.T.M. & H.: Senior M.O. Gold Coast;
MACLURE, H. L., M.R.C.S., D.T.M. & H.: M.O., Sierra Leone;
THOMAS, E. J., M.R.C.S.: pathologist, Northern Rhodesia;
TURNER, L. H., M.R.C.S., D.T.M. & H.: M.O., Malaya; and
TYSON, W. J., B.M. Oxfd, D.T.M. & H.: M.O., Malaya.

Births, Marriages and Deaths

BIRTHS

ACTON.—On April 9, the wife of Dr. Hugh Acton, of Okehampton, Devon—a son.

JACKSON.—On April 9, at Lincoln, the wife of Squadron-Leader R. C. Jackson, R.A.F.M.S.—a daughter.

JORY.—On April 7, at St. Albans, the wife of Mr. Norman Jory, F.R.C.S.—a daughter.

MACKIE.—On April 12, the wife of Dr. Carmichael Mackie, of Stourport-on-Severn, Worcestershire—a son.

ROCYN-JONES.—On April 2, the wife of Dr. Gwyn Rocyn-Jones of Llantarnam, Mon.—a daughter.

MARRIAGES

GELL—GORDON.—On April 5, at Cambridge, Philip G. H. Gell, M.B., to Albinia Susan Roope Gordon.

IBBOTSON—CARTER.—On April 4, Colin Ibbotson, M.B., lieutenant, I.M.S., to Irene May Carter.

DEATHS

BOON.—On April 12, James Ebenezer Boon, L.R.C.P.E. of Priory Road, Bedford Park, W.

COLLINGWOOD.—On April 11, at Clifton, Percy Hildebrand Collingwood, L.S.A., lieut.-colonel, R.A.M.C. retd.

FIGG.—On April 10, suddenly, at Southampton, Major C. A. Figg, O.B.E., R.A.M.C., retd.

FORBES.—On April 8, at Tunbridge Wells, James Graham Forbes, M.D. Camb., F.R.C.P., D.P.H., aged 68.

FORSYTH.—On April 10, in London, David Forsyth, M.D., D.Sc. Lond., F.R.C.P.

GILLISON.—On April 6, at Frimley, Gordon Colebrook Gillison, M.B. Edin., of Kingwood, Henley-on-Thames.

GRIFFITH.—On April 9, Arthur Stanley Griffith, C.B.E., M.D. Lpool, Ph.D. Camb., D.P.H., aged 66 years.

HALL.—On March 29, at Belfast, Robert Hall, L.R.C.P.E., aged 79.

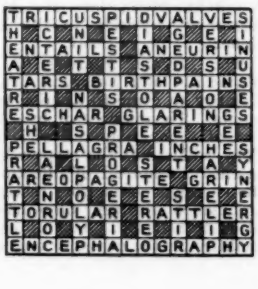
O'FLAHERTY.—On April 8, at Westward Ho, Devon, Austin Romuald O'Flaherty, M.R.C.S., lieut.-colonel, R.A.M.C. retired.

SNELL.—On April 6, James Eric Boobbyer Snell, M.B. Camb., Edwalton, Nottingham, aged 63.

THOMSON.—On April 3, in London, Ruby Thomson, M.B. Edin., D.P.H.

ROYAL ALBERT EDWARD INFIRMARY, WIGAN.—In the appointment of a House Surgeon (A) at this hospital the salary, which is at the rate of £150 per annum, with full residential emoluments, was given incorrectly in the advertisement owing to an unfortunate misprint.

MESSRS. BURROUGHS WELLCOME have added *p*-benzylphenyl carbamate to their range of products under the name of Oxylan in the treatment of threadworm infestation. It is free from undesirable side-effects and is readily tolerated by children. It destroys the parasites in situ instead of paralysing or dislodging them. The product is issued in bottles of 20 and 100 tabloids of gr. 7½.

SULPHATHIAZOLE is now available without charge to doctors and hospitals at 62 laboratory supply stations in New York State for the treatment of pneumococcal infections. Its distribution follows acceptance of the drug by the council of pharmacy and chemistry of the American Medical Association.

THE LANCET CROSSWORD: LAST WEEK'S SOLUTION